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STATE OF MONTANA

Department of Public  
Instruction

ARBOR DAY MANUAL

"The Groves Were God's First Temples"

State Flower: The Bitter Root

"Lewisia Rediviva"



ARBOR DAY

MAY 11, 1909

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STATE OF MONTANA

Department of Public  
Instruction

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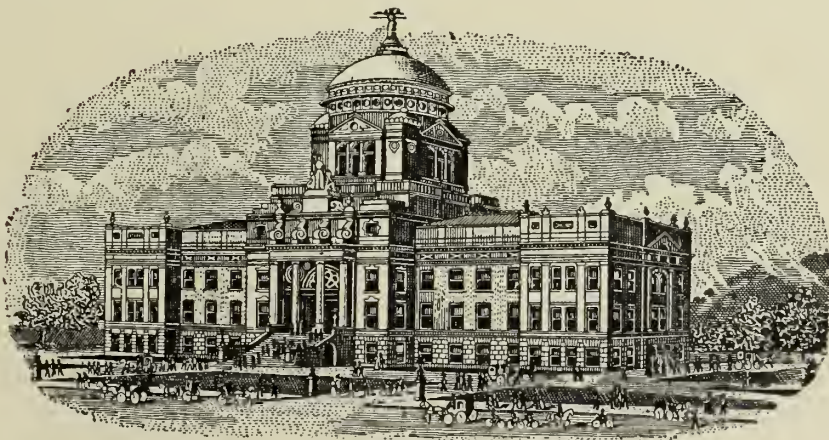
ARBOR DAY MANUAL

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"The Groves Were God's First Temples"

State Flower: The Bitter Root

"*Lewisia Rediviva*"



ARBOR DAY

MAY 11, 1909



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# ARBOR DAY MANUAL.

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TO DISTRICT CLERKS AND TEACHERS.

You are hereby requested and urged to keep and preserve the annual numbers of the Arbor Day Manual as a part of the school library.

The material found in them has been selected and obtained from a large number and variety of sources with the object of providing a permanent collection of literature for the use of both teacher and pupil in the future in connection with the observance of Arbor Day.

The program herein outlined is suggestive only, and should be modified to meet the conditions existing in each school district.

W. E. HARMON,

Helena, Montana,

Superintendent of Public Instruction.

March 20, 1909.

The monarch oak, the patriarch of the trees,  
Shoots rising up, and spreads by slow degrees;  
Three centuries he grows, and three he stays  
Supreme in state, and in three more decays.

—Dryden.



## INTRODUCTION.

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The purpose of this publication is to give information to the children of our public schools and to their parents relating to tree-planting and the preservation of our forests. Forest growth and culture are among the most important questions affecting the present and future destinies of our people. For the information herein contained we are much indebted to educators in all parts of our country and to the National Bureau of Forestry, and we have herein freely used their ideas for the benefit of our school children in the belief that their opinions ought to be scattered broadcast among the people and their children to develop among them an active interest in tree-planting and forest culture. This manual is largely a reprint of the one published last year. Many of the unfortunate facts relating to the loss and destruction of our forests together with those facts relating to their protection, cultivation, and extension, appearing in former Arbor Day publications, are herein repeated, in the hope that the sentiment and feeling then aroused in regard to tree-planting might be further stimulated and developed at the present time.

That our forest areas have for many decades been threatened with destruction and that they now sustain an unfortunate, almost trifling, comparison with our forest areas of a century ago, are facts evident to all and regretted by all alike.

That the yearly increase and growth of our forests bear an unfavorable comparison with the quantity of timber annually taken from them are facts well known to all of our lumbermen.

Mr. Gifford Pinchot, chief of the Forest Service of the United States, informs us that the present annual consumption of lumber in our country is approximately 100 billion feet, while the annual growth is but a third of the consumption, or from 30 to 40 billion feet. This shows that our timber supplies at their present rate of consumption will last about 33 years.

How, then, to preserve our forest areas, how to increase them, how to protect them from devastation, and how to render them in the future sufficient to supply the demands to be made upon them, all become questions of paramount interest

and of deepest consideration by our state and national governments. The American people as the result of a century of forest consumption, and to some extent of wanton waste and destruction of their forests, are now slowly yet effectually learning that the best way to preserve their wealth in forests is to take from them each year for timber and for fuel a quantity never greater than their annual growth and increase.

In our last Arbor Day Manual we quoted information from many sources showing the necessity and national importance of tree-planting and forest culture, and herein we again print much of the information contained in that publication under the impression that truth relating to tree planting and forest culture, many times repeated and often studied by our school children, will have a wholesome and beneficial effect upon them both now and in the future.

### EXTRACT FROM PRESIDENT ROOSEVELT'S LETTER TO THE SCHOOL CHILDREN OF THE UNITED STATES.

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“A people without children would face a hopeless future; a country without trees is almost as hopeless; forests which are so used that they can not renew themselves will soon vanish, and with them all their benefits. A true forest is not merely a storehouse full of wood, but, as it were, a factory of wood, and at the same time a reservoir of water. When you help to preserve our forests or to plant new ones you are acting the part of good citizens. The value of forestry deserves, therefore, to be taught in the schools, which aim to make good citizens of you. If your Arbor Day exercises help you to realize what benefits each one of you receives from the forests, and how by your assistance these benefits may continue, they will serve a good end.

“THEODORE ROOSEVELT.”

“The White House, April 15, 1907.”

## ARBOR DAY PROCLAMATION.

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Trees growing along streets and highways, in parks and other public places, and about private premises, will furnish a pleasing shade in season and add beauty to the surroundings. This is the ornamental side of tree planting.

Trees planted on barren and denuded mountain sides and in waste places will in time furnish timber products of value and afford protection to the watersheds. This is the practical side of tree planting.

The planting of trees awakens in the planter a higher appreciation of things beautiful and creates a greater regard for the things practical that do not mean immediate profit.

The federal, state, county and municipal governments should engage in, provide for, and in every reasonable way encourage tree planting for both ornamental and practical purposes.

To further this most worthy purpose, and in accordance with the statute in such case made and provided, Tuesday, the eleventh day of May, 1909, is hereby designated as

### Arbor Day.

On this occasion the citizens of the State should devote at least a portion of the day to tree planting and culture, and in the schools such exercises should be conducted as will give to the children a fuller knowledge of and a greater love for the growing of trees.

In Witness Whereof I have hereunto set my hand and caused the Great Seal of the State to be affixed.

Done at Helena, the Capital, this the twenty-fourth day of March in the year of our Lord one thousand nine hundred and nine and of the independence of the United States the one hundred and thirty-third.

EDWIN L. NORRIS.

By the Governor:

A. N. YODER,

Secretary of State.



## THE DESTRUCTION OF OUR FORESTS.

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The destruction of our forests began with the settlement of our country. "Since then," said the Hon. J. Sterling Morton, "ax in hand, the race has advanced from the Atlantic seaboard westward for more than two centuries, devastating forests with most unreasoning energy, always cutting them down and never replanting them. Hewing their way through the eastern and middle sections, the pioneers destroyed without thought of their posterity millions upon millions of acres of primeval woodlands."

The destruction has been going on continually for more than two hundred years, the amount of timber consumption, waste and destruction being annually greater and greater.

"That consumption annually amounts," said N. H. Eggleston ten years ago, "to 350 cubic feet per capita in our country, as against 12 to 14 cubic feet per capita in Great Britain and about 40 cubic feet per capita in Germany. The rapid increase of our population has caused this largely increased demand for lumber, and as a result we have been consuming our forests at a rate far beyond the supply furnished by their annual growth."

The above statements from these eminent authorities, startling as they seem, bring us face to face with the thought of a forest famine in the near future, and they give us time to reflect upon the dread consequences of such a famine and to provide against it.

The best estimates ten years ago made the annual consumption of our forests, for fuel and lumber chiefly, 25,000,000,000 cubic feet. To furnish this amount would require the produce of the annual growth of 1,200,000,000 acres of woodland, whereas our total forest area is less than 500,000,000 acres. It will therefore be noticed that more than half of our annual consumption was a draft by so much upon our forest capital, when we should then have been drawing from the forests only the amount of their annual growth, or the interest of that capital." —Eggleston.

The reader is naturally led to ask, "How long at this rate

of consumption will it be before our timber supplies will become exhausted?"

How, then, to rehabilitate our forest areas, how to invest them again with their former vegetation, to plant and to cultivate new forest areas, to till them, to care for them as thoroughly and systematically as the farmer cares for his corn or hay crop, to wait at least fifty years or longer in order to reap the first fruits of such labor, are now questions for consideration by our state and national governments; questions in fact, forced upon us by the constant destruction of our forest wealth during the past fifty years.

"With the enormous consumption of our forest trees now going on and rapidly increasing and the consequent diminution of our forest areas, the need of tree planting and tree cultivation becomes greater with every passing year, and the importance of Arbor Day constantly increases. Its great value is not so much in the number of trees as in the tree sentiment created and stimulated by the Arbor Day observances, which will be helpful in arresting the wasteful destruction of our forests and lead on in due time, it is hoped, to all private and public tree planting which our present and future interests may demand." —Eggleston.

### **A GRIM PREDICTION AND A RAY OF SUNSHINE.**

In his last message to Congress, President Roosevelt makes the following very significant and somewhat startling statement: "Thanks to our own recklessness in the use of our splendid forests, WE HAVE ALREADY CROSSED THE VERGE OF A TIMBER FAMINE in this country and no measure that we now take can, at least for many years, undo the mischief that has already been done." We are using up timber three times as fast as it is being produced, the annual consumption now being more than one hundred billion feet, requiring thirty million acres of forest, or more than 100,000 acres a day. The Forestry Department of the United States Government has issued a bulletin in which the statement is made that at the present rate of destruction the last tree will be gone in less than twenty years. What will happen then? A writer in Success Magazine

makes the following grim prediction :

### WHEN THE WOOD IS GONE.

“Do you begin to see the picture? Can you imagine what it will be in thirty years?

The lumber business, now the fourth largest in America, will be the first to fail. Thirty-three establishments will immediately close their doors. At the same moment more than half a million employes will be thrown out of work; they will be joined by a million in the allied trades coopers, joiners, carpenters, planers, wallpaper makers; then another million from the trades indirectly affected. It will be such an army of unemployed as was never dreamed of in the world's history.

The mines will fail. There will be no coal, no iron, no steel for the skyscrapers, no steel for rails. The railroads will go out of business. Without transportation facilities the farmers will be unable to market their crops already diminished by uncontrolled drought and flood. As our national prosperity depends on the railroads and the crops, there will be no prosperity. In its place poverty—poverty of China, Greece, Syria, Dalmatia.

This, or something very like it, is the picture of this great land of ours when the forests fail. And it will be more than a mere picture. Unless you decide to act it will become a grim reality.”

This is perhaps an extreme view but the practical significance of this at present is the fact that the price of lumber has doubled during the last ten years and will more than double during the next ten years. The principal railroad and telegraph companies are paying \$6.00 a piece for 35-foot poles. A Eucalyptus tree will grow a 35-foot pole in less than ten years and 800 can be grown on an acre. Assuming that only 500 will be ready to be cut in ten years, which is a very conservative estimate, and that the net returns will be only \$5.00 each, the proceeds from an acre of Eucalyptus will be \$2500.00, or \$25,000.00 from a ten acre estate. And the estates will still produce a steady, permanent, annual income, because there remain 3,000 trees which have not been cut and those which have been cut grow from the stump much more rapidly than from the original seedling on account of the established root system.

(Extract from letter of Sacramento Valley Improvement Company, April 5, 1909.)



## SOME WARNING LESSONS FROM HISTORY.

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“Old Canaan in the time of Joshua was ‘a land flowing with milk and honey,’ that is,” says Emil Rothe, “it was a country of wonderful fertility, blessed with a delightful climate. Both ranges of the Lebanon mountains were then densely covered with forests. Its large and constantly increasing population enjoyed comfort and abundance during centuries. But the gradual devastation of the forests brought about a general deterioration of the country.

“The hills of Galilee, once the rich pasturing grounds for large herds of cattle, are now sterile knobs. The Jordan has for ages been an insignificant stream, and the several beautiful small rivers in Palestine now appear as stony runs, being completely dry during the greater part of the year. The few cedar trees still remaining on the barren and rocky steeps of Lebanon look mournfully down upon an arid and desolate country fit to sustain less than a sixth part of the population it contained in the time of Solomon. The cause of this marked and calamitous change was the destruction of the forests.”

“The climatic history of the Old World,” says Dr. Felix Oswald, “will repeat itself in America. Its significance may be inferred from the experience of the Mediterranean coast lands, where thousands of god-gardens have been turned into Gehennas of wretchedness and desolation. By tree destruction alone a territory of 4,500,000 square miles has been withdrawn from the habitable area of our planet.”

### Spain.

“In the time of the Moors the Iberian peninsula yielded grain and fruits of every known variety, quality, and in endless abundance, and was thickly populated by a highly cultivated people. Then the mountain slopes were covered with a dense and luxuriant growth of timber, which was afterwards destroyed under the rule of the kings. Results—now nearly all the plateau lands of Spain, being a third of its entire area, are desert-like and unfit for agriculture because of the scarcity of moisture. The once fine climate has become changeable and



rough since there are no more forests to break the force of the scorching Salano and cold Galego winds.

“The average depth of the rivers has greatly diminished. The government, well aware of the cause of the deterioration of soil and climate, has lately made earnest efforts to replant the old forest grounds, but has met with little success because it is very difficult to make trees grow on former timber land that has been lying waste for a long time. It will take a full century of time, and necessitate an immense outlay of money, to restock Spain with sufficient timber. The evils of forest destruction are perhaps nowhere more signally illustrated than in Spain. One writer, Rentzsh, goes so far as to ascribe the political decadence of Spain wholly to the destruction of her forests.”—Rothe and Encyclopedia Britannica.

### Sicily.

“Look at Sicily, once the great grain reservoir for Rome. Since this island of plenty was despoiled of its forests, it gradually lost its fertility and mildness of climate. The ruins of the proud and opulent Syracuse are now lying in a desert, covered with sand which the hot Sirocco carried over the Mediterranean from Africa. A few isolated and carefully cultivated districts of small area are all that is now left to remind the tourist of the by-gone glory of Sicily.”—Rothe.

### Other Examples.

Italy, the island of Ascension, St. Helena, Ceylon and Santa Cruz might be cited to illustrate the connection existing between forests and rainfall. Our own country has not wholly escaped the disasters resulting from the loss and depletion of its forests. “Thirty years ago,” says Mr. Rothe, “steamboats drawing six feet of water made regular trips up the Mississippi to St. Paul. Since then forest destruction without regard to forest restoration has been the regular occupation of the lumberman along the sources of the upper Mississippi. Now the navigation with boats of half that draught is uncertain. Nearly all the tributaries of the upper Mississippi have lost one-half or even more of their former water supply. Inundations in the spring are now frequent, but in the summer time the actual

depth of many of these rivers averages hardly more inches than could be measured in feet thirty years ago."

These illustrations are the results of more than 2,000 years of observation and history. They teach us of the past. They warn us in regard to the future. They inform us that forests and rainfall are linked together to enhance the climate, the fertility, and the crop producing capacity of any country. Destroy the forests and the benefits of the rainfall are largely lost, the climate changes, the crops fail, the land becomes parched, thirsty, arid, and often a desert, becoming each year less and less valuable, while the people themselves, discouraged, dejected and cast down, as a last resort are obliged to emigrate to other and more favored climes in order to maintain an existence. These are some of the warning examples of history so often noticed in Europe, Asia and Africa, and now beginning to be noticed in America.

### SONG OF DEDICATION.

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(Air—"Columbia, the Gem of the Ocean.")

The tree we are planting this May day  
Is chosen with tenderest care;  
May beauty adorn it, hereafter,  
And clothe it with usefulness rare.  
May green leaves appearing each springtime  
Be leaves of a fair book of Fame,  
And spread to the breezes the story  
Extolling the new-given name.

The tree is an emblem of greatness,  
As, springing from one tiny seed,  
It mounts ever upward and onward  
An emblem of greatness, indeed!  
The birds sing its praises to others,  
The winds carry swiftly the tale,  
The tree is the monarch of forest,  
Of hill, valley, greenwood and dale.

—Ellen Beauchamp.

## THE ORIGIN OF ARBOR DAY.

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How to protect our forests from wanton depredation and waste, how to increase their growth, how to arouse public sentiment in all forestry matters, have, during the past forty years, often been considered by congress, by our state legislatures, by our agricultural societies, and by the American Association for the Advancement of Science.

The first to call attention in this country in an impressive way to the value and absolute need of forests, their influence upon climate and rainfall, the necessity for their culture and growth, was the late G. P. Marsh, of Vermont, for many years our representative at the courts of Italy and Turkey. In Europe he found the forests regarded as the most valuable crop which the ground can produce and every effort made to stimulate their growth to the utmost. In 1864 he called the attention of the American people to the ruthless destruction of their forests, the resultant effects on streams, climate, commerce and national conditions, and advocated systematic measures for curtailing their waste and consumption. This was the first clear, strong, statement of the needs of forest legislation and forest protection in the United States, and it awakened an interest in the treatment of our forests on account of our material welfare. See "May Days in Vermont, 1907."

It was not until 1872 that a practical movement, resulting in a strong national movement, was inaugurated by the late Hon. J. Sterling Morton of Nebraska, which has done more for the protection of our forests and the encouragement of tree planting than all our legislation.

"This was the establishment of Arbor Day, or tree planting day. It was the happy thought of this pioneer settler on the treeless plains of Nebraska, who knew and felt the value of trees about the home, as well as their importance for the many uses of life, to enlist his neighbors and his fellow settlers throughout the state, by a common impulse, growing out of common wants and feelings, in the work of tree planting on one and the same given day. By his effort the 10th day of April, 1872, was adopted as Arbor Day in his state, and on that



Arbor Day, the first ever observed in our country, more than 1,000,000 trees were planted. Since that time we learn that more than 1,000,000,000 trees have been planted and are now in a healthy, growing condition in that state through the united efforts of the school children and their parents on Arbor Day. All these trees are now thriving in a state on whose grassy plains scientists had often declared that trees would not grow, the few specimens formerly existing there being found along its water courses and streams. Nebraska was once almost a treeless area. Now it is a state with millions of young growing trees, due almost wholly to the Arbor Day planting started by the Hon. J. Sterling Morton in 1872. So contagious was the spirit of tree planting and Arbor Day observance originating in Nebraska that in the course of the next twenty years every state and territory except Delaware, Utah and Indian Territory had enacted laws relating to tree planting and the observance of Arbor Day."—Eggleston.

The originator of the idea lived long enough to see Arbor Day adopted in more than forty states and territories, to record millions and millions of trees added to the growing prosperity of the states, to note thousands of school houses change cheerless surroundings for those of comfort and beauty, and to feel that in stimulating the planting of trees he had been an active factor in fostering a love for the school, the home and our country.—Colorado Arbor Day Book, 1907.

Arbor day is often referred to as "Nebraska's Gift to the States of the Union," and the Hon. J. Sterling Morton is known and referred to as the "Originator of Arbor Day."

### THE LIVE OAK.

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In contemplative attitude

The moss-draped oaks stand silent there—  
Veiled sisters of the cloistered wood,  
With reverent heads low-bowed in prayer;  
And many a soft "Our Father" sighs,  
And low "Hail Mary," sad and sweet,  
As some faint wailing zephyr dies  
Among the violets at their feet.

—Montgomery M. Folsom.



## THE OBSERVANCE OF ARBOR DAY.

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To the School Trustees, Superintendents, Teachers and People of Montana:

Recommendations and suggestions relating to tree planting and forest culture upon a national scale would have been unheeded and possibly ridiculed fifty years ago. Now the observance of Arbor Day has become the law of the land. Such is the contrast in public opinion resulting from the long threatened loss and destruction of our forests. It needs no prophet to foretell the ultimate results to our forests, if their present rate of consumption is to continue, if no attempts are made to check their destruction and loss, and no efforts are made to foster their growth and protection.

I trust you have read the Governor's proclamation relating to the observance of Arbor Day. The letter of President Roosevelt written a year ago to the school children of our country is full of the spirit of Arbor Day and tree planting, and is herein again published, as it shows how the people in all parts of the country have become united in urging the necessity of planting trees for the future benefit of state and nation.

Forestry will doubtless be taught in our state institutions in the near future. Tree planting should even now be taught in our common schools. Tree planting is often regarded as an occupation requiring a special kind of skilled labor to perform it. Trained tree planters are few indeed and hard to find in Montana.

The aim and object of Arbor Day is the planting of trees for the welfare of future generations. Let the school grounds be cleared and put in order long before the day arrives, let the shrubs and hedges be trimmed and all the debris carted away, let all this preliminary work be completed early so that Arbor Day can be wholly devoted to tree planting and its appropriate exercises.

A few well selected trees planted and cared for this year and during each of the next ten or fifteen years by our children will establish the custom of tree planting in every school district.

"A successful Arbor Day must see two ends accomplished. Trees must be planted and something of importance about trees must be learned to make it a practical day's work. It is not enough to recite pretty poems and bits of sentiment about trees. If we want their cooling and comforting shade about our school house doors and the walks of our cities and villages, we must take mattock and spade in hand and set out the small trees and shrubs that will in a few years grow into the handsome trees we admire. These trees should not remain strangers to us. We should become acquainted with them. We should learn about them, how they should be planted, in what kinds of soil they flourish, how they should be trimmed, to what plagues they are subject and the remedy in each case. Let us make the Arbor Day practical by doing some real tree planting and by learning something useful about our friends, the trees and the Birds."—Virginia Arbor and Bird Manual, 1906.

Read again the sentiments of Ex-Governor Poynter of Nebraska appearing in the last Arbor Day Manual:

"Let each school boy plant at least one tree which may be a shade for his noon time of life. Let every man of middle life plant a tree which may grow into a monument of his foresight when his other work is forgotten. Let all our people give up the day to tree planting. Plant shade trees. Plant ornamental trees. Plant fruit trees. Beautify the plains with trees."

These sentiments are at once stirring, forcible, strong, practical, and they appeal to every citizen, every teacher, every school girl and boy.

Trusting that you all will observe the letter and the spirit of the Governor's proclamation, I remain,

Sincerely,

W. E. HARMON,  
Superintendent of Public Instruction.

Learn well from bird and tree and rill  
The sin of dark resentment,  
And know the greatest gifts of God  
Are faith and sweet contentment.

—Alice Cary.

LETTER OF STATE SUPERINTENDENT OF PUBLIC  
INSTRUCTION TO THE SCHOOL CHILDREN OF  
MONTANA.

Helena, Montana, April 10, 1909.

Dear Boys and Girls:

Arbor Day is with us again. We are given another opportunity to give expression to a desire to make more sightly and more beautiful our surroundings. When traveling through the country there are evidences of the thought and care of thousands of girls and boys who have planted and pruned and watered, for the landscape is dotted with flowers and shrubs and trees that have been arranged by them on Arbor Days.

The pleasure that the sight of these beautiful groves give you inspires you again to adorn and beautify.

We are glad of this day, one of the most delightful of the year. The meadows are again showing their green velvet, the trees are putting forth their buds, the birds are singing merrily in the trees and all nature seems to rejoice that grim winter no longer holds sway.

I trust that you will make this Arbor Day the best one of all the Arbor Days that you have observed by making substantial additions to trees and shrubs and flowers now growing in your vicinity. You will thus aid in adding beauty to your home and school and be the recipient of pleasure in the doing.

Last year I asked you to vote for a state tree. Many did not receive the Arbor Day Manual until it was too late. This year I hope each will give an expression of his choice and thus aid in choosing a state tree for Montana.

Wishing you a pleasant and profitable time on this holiday I remain.

Cordially yours,

W. E. HARMON.



## OUR FOREST RESERVES AND THE COMMERCIAL VALUE OF TREES.

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The following interesting facts appearing in our last Arbor Day Manual are taken from the address of the Hon. J. M. Wilson at the National Wool Growers' Association, held at Helena, Montana, January 14th, 15th, 16th, 1908, and also from the Arbor Day Manual of 1903:

"The forest reserves in the United States cover an area of 147,146,240 acres, an area equal to the entire area of all of the New England states, New York, New Jersey, Delaware, Maryland, Virginia, West Virginia, and 24,000 square miles besides. This is an area equal to the combined areas of Great Britain, Denmark, Belgium, Holland, Switzerland, Bavaria, Bohemia, Ceylon and Sicily. There is one acre out of every 200 on the surface of the earth in forest reserves alone. In other words, our forest reserves are in area equal to a strip of land nine miles wide running entirely around the earth at the equator.

"Or, if you would place the forest reserves in a strip at the 40th parallel, the parallel running through Philadelphia, Columbus, Indianapolis and Denver, and extending from ocean to ocean, it would make a strip 86 miles wide and 2,650 miles long.

The area of forest reserves in Idaho amounts to 37.4 per cent of the area of the entire state. The forest reserves and the public lands of the United States combined are larger in area than the twenty-six states of the union east of the Mississippi river. The forest reserves and the public lands comprise 29½ per cent of the entire area of the United States and 1.7 per cent of the area of the land of the entire world. These lands would make a strip around the earth at the equator 35.7 miles wide, or following the 40th parallel, it would make an empire 336 miles wide, extending from the Atlantic to the Pacific."

The report of the director of the mint for 1894, the report of the Department of Agriculture for 1894, and the best estimates of the value of the products of our forests for the same year, show that our forest crop exceeded by about \$15,000,000 the combined value of our output of gold, silver, iron, copper, lead,



zinc, coal, lime, natural gas, petroleum, etc., and the value of our wheat, corn, oats, rye, barley and buckwheat.—Arbor Day, Its History and Observance, for 1896.—N. H. Eggleston.

Many millions of dollars of American capital are invested in various enterprises which require a much longer time to yield profit or income, and never pay nearly as well as systematic forest culture in proper localities. Great fortunes are risked in speculations in railroads which pay no dividends, in mines which enrich only the brokers who sell them, in lands and lots which never attain the expected increase of value.

Our soil and climate produce a much larger variety of valuable timber than any European country. Our American hickory, black walnut, hard maple and wild cherry, for instance, have no equals in Europe. They excite the envy of European carriage makers, furniture men and manufacturers of tools. Besides growing taller than in Europe, the most useful trees attain full development here in two-thirds of the time there required, an advantage which can not be overestimated.

Austria and Italy make forest culture an unfailing source of yearly revenue. They find it profitable to buy tracts of inferior lands at prices equal to those of our best farming lands, and to stock them with timber. Many private owners, also derive large incomes from their forests without ever diminishing their area.

Forests are divided into as many equal parcels as the trees require years for development. They are cut in rotation, one each year, and immediately replanted after clearing. Only the better class of wheat or meadow lands net a greater average revenue in twenty-five years than well managed forests. This is a fact which at first sight seems incredible, but which is easily understood when the yearly expenses of grain culture and the small outlay required for maintaining a forest are compared, and by taking into consideration the frequent failure of the grain crops, and the sure steadiness of the growth of trees.—Arbor Day Manual, 1903.

## FOREST PROTECTION AND CULTIVATION.

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How to preserve our forests, how to protect our wealth in trees, how to cultivate them and to foster their growth, are subjects now claiming the attention alike of the President and Congress, of Governors and State Legislatures.

The chief objects of forestry work are to secure a continuous supply of wood for man's use, and to conserve the water supply of the country. The presence of forests influences the rainfall, causing its more regular distribution. The forests hold the water in the soil, which yields it gradually in the form of gently flowing streams.

The work of forestry does not aim to exclude the ax of the lumberman, but to guide the axe to the trees that are ripe for cutting, and to prevent the ruthless destruction of young trees and of whole sections of woodlands, whose continued life and growth means the protection of the all-important water supply.

We believe that the time is coming, possibly within the life time of the girls and boys now in school, when the forest grower will plant and cultivate forest trees as the fruit grower now plants and cultivates his fruit trees, when acre after acre of ground will be carefully selected and prepared for the planting of forest trees, and carefully cultivated, although these trees may not yield a return in lumber for the next 50 or 100 years. This means that one generation will plant and cultivate a forest for the use and benefit of the next and following generations. This idea is, however, quite contrary to the spirit of the present money making age. To make an investment now, the income of which cannot be realized during the lifetime of the investor, and probably not for the next fifty, seventy-five or one hundred years, is a thought rarely for a moment to be entertained by our people. To make provision for their children's grandchildren is a subject too remote for their consideration. To sow now and to reap now is their present all absorbing thought. But to sow now for others to reap a century hence is a thought usually scouted and ridiculed by all of our business men. Yet this very idea, as applied to the growth of our forests, must be put into practical execution before we and those coming after

us can hope to recover our former wealth in forests, and this is the very thought, idea and principle practiced and enforced by the Germans for more than a century past.

Shall our forests, once the wonder and grandeur of our national domain, but now marred, scarred, hacked, mutilated and destroyed in countless ways and in a thousand places, be still further destroyed until scarcely a vestige of them remains? Will nothing be done to save them from the wanton destruction of the past and present?

Centuries of time were necessary to produce them. The past fifty years have almost ruined them. The lumber barons with ax and saw have constantly depleted them and are constantly active in their further destruction. Instead of one day being set apart for tree planting, let a full week or more be given by all citizens to this one question of national importance, and we predict that forest destruction in the near future will be restricted by proper legislation, that tree planting and forest cultivation will become steady and regular occupations encouraged by state and nation, that a systematic course of forest protection will be enacted and vigorously enforced, and that the next fifty years will do much, a great deal, in fact, toward restoring our forests to their ancient grandeur and to a value and wealth greater with each recurring year.

These are some of the thoughts aroused and set in motion by the President's proclamation issued a year ago in regard to Arbor Day and the necessity for its observance.

### AN EDUCATOR.

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"In learning," proudly said the birch,

"I once played quite a part;

Whenever little boys were dull,

Why, I could make 'em smart."

—From St. Nicholas.



## FORESTRY IN EUROPE.

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The following information appearing in our last Arbor Day Manual was taken from "Planting Trees in School Grounds and the Celebration of Arbor Day," by J. Eaton, former commissioner of the Bureau of Education.

"In Germany the management of forests by the state has been carried on for hundreds of years and vast tracts of sterile land have been redeemed by government forestry. Here we find a model not only of systematically planting thousands of acres of trees, but a general system of forest management and careful experiments made to find out the rate of tree growth, and to find out the best kind of soil for each kind of tree, and experiments in every branch of forestry, resulting in hundreds of thousands of acres being worked to the best advantage, to promote forest growth, the annual yield of lumber being now and for many years to come known and calculated to within a few hundred cubic feet. In Prussia the forests form a part of the finance department and are watched over by a small army of overseers, each of whom cares for about 3,000 acres. In Prussia 10,000,000 acres of state forests growing on rocky lands and hillsides yield a net profit of 65 cents per acre. The steepest and rockiest hillsides are all covered with forests created by the labors of the forest department. In Saxony the state forests of 400,000 acres yield a clear net profit of about \$3.00 per acre, and in Bavaria the forests yield a net income of \$1.50 per acre. In Hanover 600,000 acres of state lands yield a clear net profit of \$1.40 annually from each acre. In the German national appropriation bill large sums are annually set apart for the purchase of such lands as are unfit for cultivation and for utilizing the same by planting trees.

"From these interesting facts it appears that tree planting and forest culture in Germany have long been constant occupations and that every acre of ground is made to produce something of value to the people and government wherever it is possible.

"These are some few of the practical methods and lessons in forestry practiced and taught in Germany for a century past.



Old and well known as are these facts to European foresters, they are just now beginning to be known and understood here. Schools of forestry have long been established in France, Spain, Denmark, Italy, Germany and Russia. In these national schools, particularly in Germany, forest trees are studied and cultivated with the same diligence, care and attention that is now given to fruit trees in this and other countries. Forest botany in these schools is a subject of special importance. All kinds of birds and animals injurious to forest trees are noted and studied with special attention. In the German schools, says R. W. Phipps, an eminent authority, 'All kinds of tree insects are shown in the several stages of their existence—larvae, chrysalis, caterpillar, moth—with their ramifications in the stem or branches of the tree. In cases where the animal or insect does damage to trees, specimens of the branch, leaf or cone in a healthy condition, and in their condition after being attacked, are exhibited so that the students of forestry can see at a glance the nature of the damage and can connect it with the insect or animal causing it.' "

Forest botany, like the anatomy of the human body, is a science now studied and practiced in Europe to the end that all tree diseases may have their causes known and analyzed and the proper remedies applied to restore them to health.

Forest planting and forest cultivation are still in their infancy in this country. They are occupations which in Europe have required a full century to develop, to test, and to prove their worth and permanent importance and to secure substantial incomes annually from them. If the barren wastes and the steep and rocky hillsides of central Europe have in the past produced and are now producing wood and lumber at good profits per acre, then we believe it fair to presume that, when the same system and care are applied here equally as good or even better results will eventually be secured.

Nothing appeals to our people so strongly as the business end and financial results accruing from any business enterprise. When they once realize that our rocky hillsides and the steep waste places, now worthless for crops and good only for our cattle and sheep to graze upon during a small part of each

year, can be made to produce by forest planting incomes per acre as great or even greater than those now produced in Europe from the same kind of soil and under similar climatic conditions, then we shall see forests springing up everywhere, on hillside, on mountain slope, and in valley, carefully cultivated and protected for the crops of wood and lumber sure to grow upon them.

### DIRECTIONS FOR TREE PLANTING.

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In this article the object will be to point out the way to properly plant and care for trees and to name the varieties adapted to the various parts of the state.

Under all conditions the spring is the best season to plant trees in Montana, and they should be planted as soon as the ground can be put in proper condition. It should be neither too dry nor too wet. Such a condition should exist at Arbor Day time and the trees planted thus should not die because of the fact that they are planted too early or too late. Before any planting is done the ground should be put in the best possible condition of tilth. A good plan is to plow the ground as deep as possible where the trees are to stand, and where the soil is not naturally rich well rotted barnyard manure should be applied and worked into the soil. The holes in which trees are to be placed should be dug before the trees are brought on to the ground, thus protecting the tree roots from drying out while waiting for the holes to be dug. Dig the holes deep enough and wide enough to receive the roots without cramping them or bending them out of their natural position, and on sandy soils holes should be deep enough to plant the trees so that they will stand an inch or two deeper than they stood in the nursery. The depth the tree stood in the nursery can be told by the discolored ring near the crown.

When the holes are dug and all preparations made for planting, a few trees at a time should be taken from the place where they are heeled in. The broken and bruised roots should be trimmed off so that the wounds will callous over readily, thus



making it possible for the new rootlets to start at once. Place the tree in the hole with the roots spread out in their natural position and work in fine moist soil, preferably taken from the top soil removed from the hole, and work it well around the roots with the hand. Care should be taken that no air spaces are left around the roots. After the roots are covered the dirt can then be put in a shovelful at a time and thoroughly tamped down. This is necessary to bring the soil in close contact with the roots, thus making it possible for the roots to absorb moisture and take up plant food. If the soil is dry the hole can be filled about one-half full of dirt and then entirely filled with water, which should be permitted to soak away into the surrounding soil, when the hole can be filled with dirt leaving the top inch in a loose and pulverized condition. This top dirt left loose will act as a mulch and shut off evaporation. It is a bad practice to apply water after the hole is entirely filled with dirt, as it will form a crust on top and set up capillary action, thus quickly evaporating what soil moisture is in the ground.

After the tree is planted the top should be pruned back to correspond with the loss of roots occasioned through the process of digging. The best results in later growth are usually obtained when from one-fourth to one-half of the branches are cut off. We usually cut side branches off to within three or four inches of the main stem and cut the terminal growth back correspondingly. This system of pruning applies to all deciduous trees, but the tops of evergreen trees should not be pruned if it is desired to grow them in their natural shape. After the trees have been properly planted they should not be left to take care of themselves, as is often done, but good cultivation should be given during the spring and early summer months, keeping the ground about them free from weeds and in a finely pulverized condition. When irrigation is practiced, and this is necessary to the best results in most parts of the state, the water should be applied in sufficient quantities to wet the ground thoroughly and deep enough to reach all the roots, otherwise irrigation is of little value. One or two thorough irrigations during the season will produce much better results than irrigating the surface every day or two.



As soon as the ground is dry enough after irrigation, it should be cultivated and the surface soil pulverized. Unless this is done capillary action will start in and the moisture will evaporate very rapidly. If the trees are thoroughly cultivated and irrigated during the months of June and July, they should make a rapid growth, and by stopping both cultivation and irrigation about the first of August the soil will become dry enough and cause the trees to mature their wood, thus putting them in much better condition to withstand the winter without injury. In parts of the state where there is little snowfall during the winter months, the best results are obtained when there is a mulch of straw or manure placed about the trunks of trees, as this will protect the ground from very deep freezing, shut off evaporation and stop the injurious effect caused by the alternate freezing and thawing of the ground during the winter and spring months. If the soil becomes very dry after August first, and before the ground is frozen very solid, good results are often obtained by irrigating about the first of October.

Trees should be ordered from the nursery early enough so they will arrive in time for planting as soon as the ground is in condition to set them out. If they should arrive before time for planting they can be heeled in. This is done by digging a trench deep enough to receive the roots on the trees and then covering the roots over with fine moist dirt and packing it down firmly.

The varieties and kinds of trees vary according to the different climatic conditions found in the various portions of the state, and the list following will serve to indicate the trees and shrubs likely to give the best results. At altitudes below 4,000 feet, the Carolina Poplar, the Silver Leaf Maple, the Norway Maple, the American Elm, the Mountain Ash, the White and Burr Oak, the White Birch, the Cut Leaf Birch, the Colorado Blue Spruce, the Douglas Spruce and other native evergreens can be successfully grown. The Carolina Poplar is a rapidly growing tree and has a very desirable shape. It requires considerable moisture at all times and if this is not given the trees often die.

The American elm and maples are very desirable trees, al-

though they do not grow as rapidly as the Poplar. Good results are obtained when the Elm or one of the Maples is planted alternately with the Carolina Poplar with the intention of cutting the Poplar down when the Elms or Maples, as the case may be, are large enough to give protection and shade.

The Mountain Ash and the White Birch are the best trees for all parts of the state for lawn planting either as specimen trees or ornamental trees near the house or buildings. The Colorado Blue Spruce is a very beautiful tree and hardy at all altitudes in the state of Montana.

For the higher altitudes the Balm of Gilead, the Russian Poplar, Box Elder, the willows and Colorado Blue Spruce and native evergreens are adapted to general planting. In the list of hardy shrubs suitable for ornamental purposes are several varieties of the Lilac, the American and European Barberry, Purple Leaved Barberry, Caragana or Siberian Pea tree, native Chokecherry, the Tartarian Honeysuckles, the hardy roses when given protection during the winter, Spiraea Vanhouttei, Spiraea Thunbergii. In this list the lilacs and the Siberian pear tree are the hardiest and therefore best adapted to general planting, although all the others can be made to grow with ordinary care.

Bozeman, Jan. 20, 1908.

R. W. FISHER,

Horticulturist, Montana Exp. Station.

### A RIDDLE.

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I have only one foot, but thousands of toes;  
My one foot stands, but never goes.  
I have many arms, and they're mighty all;  
And hundreds of fingers, large and small.  
From the ends of my fingers my beauty grows,  
I breathe with my hair, and I drink with my toes.  
I grow bigger and bigger about the waist,  
And yet I am always very tight laced.  
None e'er saw me eat—I've no mouth to bite;  
Yet I eat all day in the full sunlight.  
In summer with song I shake and quiver,  
But in winter I fast and groan and shiver.

—George McDonald.

## USES OF THE FOREST.

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About 60 per cent of all our railroad ties are made of white oak; nearly 20 per cent are pine. Since every mile of railway needs about twenty-five hundred ties, and there are over two hundred thousand miles of such roads in our country, it takes millions of acres of timber to supply a single set of ties. Such a set has to be replaced about every seven years. Thus it is that the railways rank among the greatest consumers of wood in the country.

Our telegraph and telephone poles are made largely from hemlock and cedar. The price paid for such timber varies from two to ten dollars per pole.

Flour barrels are made largely from elm. Barrels for liquids from a fine grade of white oak; also ash and elm.

Our furniture is made from walnut, ash, oak, maple and other hard woods.

White oak and hickory are used in manufacture of wagon and buggy wheels. Soft woods, as poplar, aspen, spruce, pine and basswood, are used in the manufacture of paper such as is used in newspapers, note books, etc.

Three-fourths of our lumber is made from soft woods, such as white pine, spruce, hemlock and redwood.

The woodwork of machinery is made from hard wood lumber, which constitutes about one-fourth of our lumber output. It comes principally from the wide region east of the Mississippi, between the northern and southern soft wood belts.

The great pineries of Wisconsin, Minnesota and Michigan supply our white pine, the most useful timber in the north temperate zone, because it is in greatest demand for building purposes.

The bark of the hemlock tree is used in the tanning of leather.

Corks are made from the bark of the cork oak, which grows only in the Mediterranean countries and Portugal.

As a national industry, forestry stands second only to agriculture in number of persons and amount of capital employed and in value of product.

It has been estimated that we have five hundred million acres of growing forest, and that thirty-five cubic feet of wood are produced annually per acre.—Selected.



## WHAT TREES DO.

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Trees are among the most common things in nature. They either cover or have covered a large part of the earth's surface that is suitable for human life. They are the natural friends of man, yet we often treat them with scant courtesy, and, sometimes regard them as of little use, if not actual enemies. Let us study together a short and easy chapter in the open book of nature, and learn some of the things that trees do.

Trees, like animals, are living things, but there are differences between them. Trees do not eat, move or feel; animals do.

We know that animals grow or become larger. This is due to the food they eat. Trees also grow, but they use different food, and take it in quite a different way. They live upon mineral matter,—that is—air, water, and soil, which they change into their own substance. By this gradual addition of new material, trees become larger and larger each year, for growth is simply the increase of a living thing in size and substance.

What do trees do? I will tell you.

1. They help to keep the air pure for man and the lower animals.

How do they do this? I have just told you that trees are constantly changing mineral matter into vegetable matter. This is their special work.

The element of the air that makes it fit for breathing is a gas called oxygen. About one-fifth of the volume of the air is oxygen, and at every breath animals take in some of this oxygen and change it to carbonic acid gas. In other words the oxygen that is breathed in, combines with the carbon in the blood and this makes carbonic acid, which is breathed out into the air in place of the oxygen taken in. There is a small amount of carbonic acid gas in the air everywhere and at all times, the usual amount is about one part in every 2500 parts of air.

This carbonic acid is unfit for the breathing of animals and wherever it increases in the air, even to a slight extent above the amount usually found, animals cannot live. Trees and other plants prevent the carbonic acid from accumulating in dangerous quantities in ordinary air. They do this by absorbing this gas

through their leaves. It is their principal food. It makes trees grow, for a little more than one-half of the trunk and branches of every tree is carbon, and this all comes from the carbonic acid of the air.

You know what happens when we cut a tree down and burn it. The great mass or bulk of the tree passes into the air in the form of smoke and gas. A very small part remains in the form of ashes. Burning just undoes what growth did. The burning process was rapid, while growth was slow. But, roughly speaking, everything that went into the air when we burned the tree came from the air during its growth, and all that remained on the ground in the form of ashes came from the ground while the tree was growing.

Think for a moment how well fitted trees are for taking the carbonic acid from the air!

Suppose you carefully measure the upper surface of the leaf of an oak tree, multiply this by two, for the under surface has the same area; then multiply this by the number of leaves on the tree and you can then form some idea of the enormous surface which the tree annually presents to the air for the removal of what to us is a dangerous gas.

2. Trees supply a large part of the fuel in the world.

The real wood of trees is of little or no use as food, but it does largely serve to cook our food and to protect us against cold. Even the coal dug from the earth, as well as the oil and gas now so generally used for fuel, come from vegetable matter and are largely the remains of trees in forests that flourished before man existed on the earth.

Did you ever stop to think where the heat of fuel comes from?

Trees grow, or store up vegetable matter by absorbing carbonic acid. This is separated into carbon and oxygen before it can be used, and this separation takes place only in the presence of sunlight. With every particle of carbonic acid that is thus separated and with the new substance made by the tree for its growth, a certain portion of the sun's light and heat is absorbed. Thus, when we burn wood, the heat and light given out are just what was absorbed when the tree was growing.

I once heard a story of a boy who set out to catch a sunbeam—this may have been a light task, but certainly not an easy one, for a sunbeam can travel eight times around the world in a second, or 480 times a minute. Yet the growing trees does catch the sunbeam, and holds it a prisoner until it is released by burning.

3. Trees give us wood, and wood furnishes us with building material, furniture, implements, utensils, tools, and other useful things in great variety. Wood is one of the necessities of life. We are rocked in cradles made of wood; when we sit down it is on chairs or benches of wood; every day we eat from wooden tables; the papers and books that we read and study are printed on paper made from wood; whenever we ride out it is in a wagon, carriage or car made largely of wood. More than one-half of all the houses in the world are built of wood and the other half use wood for doors, floors, and other interior parts. We ship our fruits, vegetables and many other products in baskets, crates and barrels made of wood; we pack our butter and pork, and buy our nails and salt in firkins, kegs, or barrels of wood. Next to our daily food wood is the most useful single product in the world. It is indispensable to our comfort, convenience, and happiness.

4. Trees furnish one of the most striking and permanent forms of beauty. What stately grace, what fine proportions, what variety of expression, and what unconscious dignity may be seen in a well developed tree. How they beautify and glorify every landscape. There is nothing more picturesque in nature than a clump or group of sycamores growing near a river bank and bending their mottled trunks and stretching their whitened arms toward the water, for which they show a peculiar fondness.

5. Trees improve the climate and conserve soil and water. Although the influence of trees and forests on climate is not definitely known, we are beginning to feel the effect of an all too reckless destruction of our woodland. Springs and streams are failing that never failed before; soil drouths are more severe and protracted. Untimely frost are more ruinous to all the more delicate fruits, and wind storms are more damaging than in former years.



The floods, that have caused such loss of life and property in the river valleys of Ohio and elsewhere, have followed the cutting off of the forests from the hills and the washing of the soil by the rapid run off of the rain and melting snow and are rapidly reducing the hills to rocks wastes and covering the fertile soil of the valleys with coarse sand and gravel. It is said that "Fire is a good servant but a bad master." The same is true of water. Uncontrolled water, like uncontrolled fire, changes a blessing into a curse.

6. Trees furnish safe shelter and natural resting places for birds. Birds are our best allies in fighting insects, but the removal of our forests has greatly lessened the number of insect-eating birds. Thus our insect enemies are increasing because the birds are becoming scarce.

The scarcity of birds is not entirely due to the cutting down of our trees. Many boys have the bad habit of shooting birds and robbing their nests. This ought not to be. The boy who shoots a bird or robs a bird's nest is robbing the farmer of a part of his crops. The best protection for insect-eating birds is plenty of trees. By planting and saving our trees we cherish and protect our birds.

7. Trees furnish a great variety of miscellaneous, useful products; Among these we may mention fruits, nuts, sugar, honey, tannin, pitch, turpentine, dyes, and medicines.

As the only source of wood supply, trees touch the welfare of every man, woman, and child, but their influence goes much farther. It underlies the great questions of soil preservation and soil fertility; the use and control of streams and rivers; the water supply of towns and cities. In short, our civilization and progress as a nation are based very largely on trees. In the face of these facts we are still slashing down our trees recklessly, with little or no regard to restoring them, or in any way making good the loss. There is no crime against nature that draws down more certain or severe punishment than that of stripping the earth of all her trees.

Let us awake to the importance of planting trees and saving our forests. Let our boys and girls be incited and encouraged to gather the seeds of our most valuable trees. Plant a part of

your seeds in some corner of the garden or in any rich ground where they are not likely to be disturbed. Keep the remainder in boxes of moist earth in a cool cellar until early spring and then plant them. You can scarcely fail to enjoy this work, and at the same time add to your knowledge and increase your love of trees.

W. R. LAZENBY, Professor of Forestry,

Ohio State University.

### WHAT UNCLE SAM IS DOING.

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Probably a very small proportion of the persons who will this year participate in the American observance of Arbor Day will realize in this connection that the United States government maintains a big institution, the primary purpose of which is to not merely encourage but actually carry on tree planting. This establishment is a branch of the United States Forest Service. It has in charge the management of our forests and concerns itself largely with tree-planting and forest extension.

Last year Uncle Sam's official tree-planters set out upward of half a million trees, most of them located in the national forests. Not only does the government plant trees in the national forests, maintaining its own nurseries as a source of supply, but it aids private owners who desire to set out trees on their property. Finally, Uncle Sam is conducting valuable experiments in nursery and planting work in co-operation with nine different universities and State agricultural experiment stations. These experiments are made to learn what species are best adapted to different regions and to improve methods of planting and cultivation.

Of late years there has been an intelligent effort made to improve the methods of Arbor Day tree planting in America, particularly as carried on at the public schools. In years gone by it too often happened that trees planted with great ceremony in April died of neglect before September. Now an effort is made to see to it that trees are not planted on dry, windy days, or when the conditions are otherwise unpromising; effort is made to provide hardy trees, and precautions taken to insure for the trees such subsequent care as will keep them constantly thrifty.

## BEAUTIFYING OUR SCHOOL PREMISES.

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If the Arbor Day Season were conscientiously observed by the people in every school district, the unsightly buildings and treeless, barren, school grounds, of which we have such a great number, would soon be replaced by attractive and beautiful premises.

The Arbor Day season is the time for our girls and boys to add beauty and value to their home and school surroundings. To develop in the pupils a love for the useful, beautiful, and the ornamental, to bring to their minds the blessings derived from trees, and to arouse them to the necessity of tree culture, are the prime objects of all Arbor Day exercises.

Let each corner of our school yards and their approaches have its trees and shrubs planted and constantly cared for by school children. Let the roadsides be planted with trees and shrubs. They are nature's fittest and choicest decorations.

"Plant shade trees, plant ornamental trees, plant fruit trees, beautify the plains with trees, plant them for protection, plant them to educate the children, plant them to beautify and to adorn the school grounds," is the sentiment constantly coming from Nebraska on each Arbor Day.

"Tree planting is a question of public economy," says Governor Adams of Colorado. "It is an act of patriotism."

"Common sense and selfishness should impel us to plant trees. A child that loves and cares for trees, flowers, and birds, will never become a bad citizen. Groves, blossoms, birds, are nature's poetry. In a treeless country you can never hear the celestial harmonies that the poets heard the wind play among the trees."

"Inspiration, patriotism, manhood, are seldom the products of a treeless land. Can we imagine a Wodsworth, a Scott, or a Longfellow without forest? There is no story of liberty that has not its trees; they blend with every memory of life. Art, literature, and mythology draw from trees some of their richest beauty."

"The life of a tree touches a more remote past and reaches to a more distant future than any other living thing. Some



of the Cedars of Lebanon have lived through every age of the Christian Calendar.”

“There is a close affinity between forests and a regular water supply. Every tree becomes a miniature reservoir, preserving for greater usefulness every inch of water from spring or cloud.”

“Every bunch of grapes, every peach, every apple, that gathers its color and flavor from our wonderful climate is the fruit of other Arbor Days.”

“As we received much from our ancestors, we owe much to posterity, and in no way can we make a greater payment on the debt than by planting trees. Trees are almost immortal. Their lives span the generations, becoming a proud memorial, a rich inheritance we bequeath to those coming after us. We are blest with valleys as rich as Eden, with mountains, skies, and climate that are ideal. We need only trees and verdure to become a home of beauty and enchantment. If for each one of our population we should plant each year but a single tree, our descendants would soon revel in a true Edenic land of beauty, happiness, and prosperity. Hopeless is the man or community that has no regard for trees. It is difficult to love a land that has no trees. The sentiment, ‘This is my own, my native land,’ was not born and finds scant echo where there are no hills nor trees.”

I ask our citizens to remember that: “He who plants a tree, or shrub, or a flower, works with God to beautify the garden of the world.”

The science of the beautiful in nature and art ought to be taught at all times in our schools but more particularly during the Arbor Day season. “The vast majority of our school grounds are without ornamentation. Instead of being the brightest and most inviting spot in the community, they too often are quite the dullest. In some localities where the private lawns are well kept and beautiful, the school grounds are bare, cheerless, unsightly, and uninviting. The public needs to be aroused to an appreciation of the aesthetic in education, and to this end there should be an aggressive, systematic, persistent campaign for the improvement of our

school premises and the approaches leading to them. Once the people are awakened to the real importance of this question, they will rise to meet it with both their time and means.”—Tree Planting and School Room Decoration, Lincoln, Neb., April, 1905.

### FACTS ABOUT TREES FOR THE CHILDREN.

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1. Cutting down trees spoils the beauty of the landscape. I would not like to live where there were no trees.
2. There are few birds where there are no trees. They have no place to make their homes.
3. Taking away the trees takes away the protection from our tender fruit trees.
4. Where there are no trees the snows melt and go off too rapidly; the moisture that should sink into the soil is carried away in the floods.
5. Because our forests are taken away we have severe droughts every year.
6. One full grown elm tree gives out fifteen tons of moisture in twenty-four hours. A large sunflower plant gives off three pints of water in one day.
7. The trees give us lumber, fuel, wood, pulp for newspapers, cork, bark for tanning, wild fruits, nuts, resin, turpentine oils and various products for medicines.
8. We should have greater extremes of heat and cold if it were not for the trees and forests.
9. The leaves of trees catch the rain and hold it a little while; then they drop the water a little at a time; this is better for the ground.
10. The old leaves make a deep sponge carpet in the woods and this keeps the ground from freezing. If the earth does not freeze it takes up the rain better.
11. We might have dangerous floods if we did not have trees. The trunks and roots of trees stop the water that comes pouring down the hillside.
12. I will be very careful not to hurt any trees, but will call every tree my friend.—Primary Education.

## STATE FLOWERS.

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Alabama.. . . .	Golden Rod
Arkansas.. . . .	Apple Blossom
California.. . . .	Eschscholzia
Colorado.. . . .	Columbine
Delaware.. . . .	Peach Blossom
Idaho.. . . .	Syringa
Illinois.. . . .	Rose
Indiana.. . . .	<b>Corn</b>
Iowa.. . . .	Wild Rose
Kansas.. . . .	Sunflower
Kentucky.. . . .	Golden Rod
Louisiana.. . . .	Magnolia
Maine.. . . .	Pine Cone and Tassel
Maryland.. . . .	Golden Rod
Mississippi.. . . .	Magnolia
Minnesota.. . . .	Moccasin
Missouri.. . . .	Golden Rod
Montana.. . . .	Bitter Root
Nebraska.. . . .	Golden Rod
New York.. . . .	Rose
North Dakota.. . . .	Wild Rose
Ohio.. . . .	Scarlet Carnation
Oklahoma.. . . .	Mistletoe
Oregon.. . . .	Oregon Grape
Pennsylvania.. . . .	Golden Rod
Rhode Island.. . . .	Violet
South Dakota.. . . .	Pasque
Texas.. . . .	Blue Bonnet
Utah.. . . .	Sego Lily
Vermont.. . . .	Red Clover
Washington.. . . .	Rhododendron
West Virginia.. . . .	Rhododendron Maximum

## TREE RIDDLES.

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- What is the most level tree? (Plane.)  
Which tree suggests thoughts of the ocean? (Beech.)  
What tree would you prefer on a very cold day? (Fir.)  
What tree can best remember numbers? (Date.)  
Which tree has passed through fire? (Ash.)  
Which is the most ancient tree? (Elder.)



## THE ELEMENTS OF AGRICULTURE.

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The most significant fact in the agricultural world today is the demand that agriculture be taught in the public schools.—E. Davenport, Dean of the College of Agriculture, University of Illinois.

In Austria every school by law must have a gymnasium and a school garden. In France they have 30,000 of these gardens and no teacher is employed who has not the ability to teach horticulture. Gardening has been for thirty years part of the public school system of Sweden, from one to twenty acres being allotted to each school. Even in Russia, in one province alone there are over 100,000 fruit trees in the school gardens. In Germany, whence the idea came, garden schools rival agricultural colleges in the scope of their work. To America is reserved the distinction of being the only enlightened country that ignores this branch of education. No wonder we have abandoned farms and overcrowded cities!—From *Tree Planting and School Gardening in Nebraska*, April, 1905.

The American people are nothing if not practical. They are a race of thinkers. As originators they have no superiors, as imitators few equals. They have had their age of fads and nonsense in the school room. Always ready to welcome new features and new methods in education when practical and beneficial, they are equally as ready to cast off old features and old methods when worn out and no longer serviceable. What new features, if any, might be introduced in our schools that will tend to more rapidly develop the ideas of the children along educational lines? "Tilling the soil," is the answer now heard from scores of educators. "Provide a school garden and get the most out of it," is the common answer coming from a hundred sources. "Place the hoe, rake and spade in the hands of the children and teach them their practical uses" say others. Give them elementary lessons in agriculture. Heed Solomon's admonition: "Train up a child in the way he should go and when he is old he will not depart from it."

"What does school gardening amount to?" is the common question asked by its critics. It teaches the children simple

lessons in mixing soils, making hot beds, in preparing ground for raising vegetables, in planting and trimming vines and shrubs, in budding and grafting. In fact, it teaches the children in a systematic way how to raise two pounds of vegetables where only one pound could with difficulty be raised before.—*Illinois Arbor and Bird Manual*, 1906.

School gardening teaches children how to prepare ground for plants and seeds, how to care for them when growing, how to thin them out, and how to keep the soil in proper condition for their growth. It teaches the simple elements of agriculture to our girls and boys. The children are taught the kinds of soil best adapted to produce each kind of vegetable. In the school garden radishes, onions, lettuce, beets, tomatoes, cabbages, peas, corn, potatoes and other vegetables are cultivated and raised on the scientific plan. Garden botany in its practical form is thus taught, and the importance of thorough cultivation of the soil is there impressed upon the children. The effect of this instruction is soon apparent.

Pupils are always quick to imitate their instructors and to put into practical effect the lessons learned at school. When they return home and begin to insist upon changing the old custom and practice of gardening by laying out in squares and rectangles beds for plants, flowers and vegetables and to prepare them for seeds, flowers, and for the transplanting of vegetables, thus making practical application of the lessons taught them, their parents and the old folks in particular wonder what new ideas and school foolishness have gotten into their heads. But when at harvest time they realize that crops of a far better quality, and often, too, in greater quantity, can thus be raised at much less labor and cost than formerly, then they begin to understand and to be convinced that system and science even in gardening produce far better results than their own former crude methods of gardening, and it is safe to predict that in the future system and not chance, knowledge and not ignorance, will rule and govern them in all things relating to gardening.

## HISTORY OF SCHOOL GARDENS.

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The following extract relating to the history of school gardens is taken from the Rhode Island Arbor Day Manual dated May 8th, 1908:

The school garden, although as yet a comparatively new feature in America, has long been valued abroad as an important factor in the education of children, and in several countries antedates the establishment of a public school system.

Comenius, the most celebrated educational reformer of the seventeenth century, said: "A garden should be connected with every school where children can at times gaze upon trees, flowers and herbs, and be taught to enjoy them."

Germany, from whom the world has learned many valuable educational lessons, may be said to be the leader in the school garden movement, for although school gardens have not been officially incorporated as an organic part of the German school system, Germany's experience in this "new" form of education extends over a period of eighty years. In 1814 instruction in the culture of fruits and vegetables appears as a part of the rural school program of several German states. Today in Germany there are thousands of elementary school gardens, and careful attention is given to training the teachers for this work.

Austria was the first country to legalize school gardens. The Austrian Imperial school law of 1869 requires that "a garden and place for agricultural experiments shall be established at every rural school." At the present time there are nearly 20,000 school gardens, while Bohemia alone has over 4,000 school gardens.

Sweden, by royal proclamation in 1869, made gardening a requirement in the legalized schools, specifying that "gardens from 70 to 150 square rods be established in connection with every elementary school."

School gardens are also required in Belgium by the school law of 1873, which stipulates that every school shall have a garden occupying at least a quarter of an acre, while the teachers are required by a royal decree of 1897 to give instruction in both theory and practice of botany, horticulture and agriculture.



Switzerland makes admirable provision for public school gardens, offering prizes for excellence, and providing gardens in connection with the normal schools in order that teachers may receive the special training needed to enable them to teach gardening effectively.

In France special emphasis is placed in all schools upon the teaching of agriculture. By order of the French Ministry of Education in 1880 the course in the normal schools was made to include such instruction as will enable the graduate teachers "to carry to the elementary schools an exact knowledge of the soil, the means of improving it, methods of cultivation, management of a farm and garden." Russia as well as France requires every school receiving public funds to support a school garden. The school gardens of a single province in southern Russia contain, in addition to flowers and vegetables, 111,000 fruit trees, more than double that number of forest trees, and 1,000 bee hives. For several years Russia has supplied special training for teachers along these lines by means of short summer school courses in horticulture, etc. Seeds and books on gardening are distributed free of charge to all schools, while expert gardeners are sent out by the government to aid teachers in establishing gardens and planning courses of study.

In all these countries where gardening is a regular subject of instruction the immediate and practical results are everywhere very marked.

In the United States the school garden movement has within a very few years developed with a rapidity that is evidence of the convincing nature of its appeal to those who have the educational welfare of the country most closely at heart.

Since the planting nearly twenty years ago in Roxbury, Mass., of the first American public school garden, the idea has taken root in many widely separated states, until at the present time there is a chain of pioneer school gardens reaching from Bath, Me., to Los Angeles, Cal.

Work in the school garden should be conducted in an orderly, intelligent manner—the children should always understand, not only what they are doing, but also just why it has to be done.

## ARBOR DAY IN IRELAND.

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Ireland is trying to re-establish its claim to be known as the "Island of Woods." It is interesting to know that an American importation—"Arbor Day"—is being made use of largely in furthering the ends of forestry.

Since Arbor Day started in Nebraska thirty-five years ago its observance has spread all over the United States. The tangible results in this country have been the planting of over six hundred million trees, for the most part by individual school children, besides the interest aroused in animate and inanimate nature and in forestry. In Ireland the movement is now fairly launched and is rapidly spreading throughout the country.

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The forests of America, however slighted by man, must have been a great delight to God; for they were the best he ever planted. The whole continent was a garden, and from the beginning it seemed to be favored above all the other wild parks and gardens of the globe.

These forests were composed of about five hundred species of trees, all of them in some way useful to man, ranging in size from twenty-five feet in height and less than one foot in diameter at the ground to four hundred feet in height and more than twenty feet in diameter,—lordly monarchs, proclaiming the gospel of beauty like Apostles.

The Indians with stone axes could do them no more harm than could gnawing beavers and browsing moose. But when the steel axe of the white man rang out on the startled air their doom was sealed.

Every other civilized nation in the world has been compelled to care for its forests; and so must we if waste and destruction are not to go on to the bitter end, leaving America as barren as Palestine or Spain.—JOHN MUIR, in "American Forests."

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As the leaves of trees are said to absorb all noxious qualities of the air and breathe forth a purer atmosphere, so it seems to me as if they drew from us all sordid and angry passions and breathed forth peace and philanthropy.—IRVING.

## HISTORIC TREES.

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I do not wonder that the great earls value their trees, and never, save in the direst extremity, lift upon them the axe. Ancient descent and glory are made audible in the proud murmur of immemorial woods. There are forests in England whose leafy noises may be shaped into Agincourt, and the names of the battlefields of the Roses; oaks that dropped their acorns in the year that Henry VIII held his Field of the Cloth of Gold, and beeches that gave shelter to the deer when Shakespeare was a boy. There they stand, in sun and shower, the broad-armed witnesses of perished centuries; and sore must his need be who commands a woodland massacre. A great tree, the rings of a century in its boll, is one of the noblest of natural objects; and it touches the imagination no less than the eye, for it grows out of tradition and a past order of things, and is pathetic with the suggestions of dead generations. Trees waving a colony of rooks in the winds today are older than historic lines. Trees are your best antiques. There are cedars on Lebanon which the axes of Solomon spared, they say, when he was busy with his Temple; there are olives on Olivet that might have rustled in the ears of the Master of the Twelve; there are oaks in Sherwood which have tingled to the horn of Robin Hood, and have listened to Maid Marion's laugh. Think of an existing Syrian cedar which is nearly as old as history, which was middle-aged before Rome was founded; think of an existing English elm in whose branches the heron was reared which the hawks of Saxon Harold killed! If you are a notable, and wish to be remembered, better plant a tree than build a city or strike a medal—it will outlast both.—Alexander Smith.

### SOME FAMILIAR HISTORIC TREES.

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Note to the teachers.—We suggest to you to allow your pupils to secure information relating to the trees below mentioned, and then to write short descriptions of them for the information of all the scholars and their parents.

- I. The Treaty Elm of Philadelphia.



2. The Charter Oak of Hartford, Connecticut.
3. The Liberty Elm of Boston.
4. Washington's Elm at Cambridge.
5. The Burgoyne Elm at Albany, New York.
6. Perry's Willow on the shore of Lake Erie.
7. The Big Trees of California.
8. The Apple Tree of Appomattox.
9. The Baobab Tree of the Cape Verde Islands.
10. The Banyan Trees of India.
11. The Cedars of Mt. Lebanon.
12. The Hamilton Trees of New York.

### THE MATCH INDUSTRY.

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"The civilized nations of the world strike three million matches every minute of the twenty-four hours. Nearly one-half of these are ignited in this country. Americans use up the enormous total of seven hundred billion a year, and have a larger match bill than any other nation in the world.

Hundreds of factories over the country are engaged in this industry, about which the general public knows but little. Some of the plants are very large; one on the Pacific Coast covers 240 acres, and has thirty-two miles of railroad to supply the match machines with 200,000 feet of sugar pine and yellow pine logs a day.

Wood for matches is a much more serious problem in some of the European countries than it is as yet in the United States. The most suitable match timbers, are, pine, linden, aspen, white cedar, poplar, birch and willow. Others, however, are occasionally used. Germany imports willow and aspen from Russia. Some time ago the Germany match manufacturers petitioned the minister of agriculture to cause the foresters to plant aspen in the state forests to supply wood for matches without importing."

"In the United States, as well as in Canada, a diligent search for choice forests is maintained, and very large tracts have been bought by companies in the match business, not only to meet

present demands, but to provide for years to come. In a single year one match company cut 225 million board feet of pine in the Lake region. There are more than 150 match manufacturers in the United States and about half that number in Canada.

If forced to economize, the people of this country might get along with fewer than twenty-five or thirty matches a day per capita as at present; but they will probably insist on having them, and will demand, as in Germany and France, that foresters plant and grow timber especially for matches. This could readily be done if forests were placed under competent management and not left to run wild, producing cordwood and brush when they ought to grow merchantable timber."—Forestry and Irrigation.

## FOREST PRESERVATION AND RESTORATION IN NEW YORK.

My desire in writing this article is to interest my readers in the protection of our forests, fish, game animals, and game and song birds. It is, of course, most important that the forest should be preserved, for upon its life depends largely the life of the fish, and the game animals and birds.

The necessity for preserving the forest for commercial purposes alone is apparent. There are on public and private lands in this State of New York about 41,000,000 feet of timber, board measure. Last year there were cut and manufactured in the State 1,500,000,000 feet of lumber, taken, of course, from private lands, since a clause in the Constitution prohibits the removal of timber from State Lands. But at the same rate of cutting, all the timber in the state, public and private, would not last more than thirty years. To be sure, there is considerable growth going on in the forest, but this is more than offset by the increasing demand for lumber on account of the rapidly growing population, and the increasing use of wood in manufacturing.

The first settlers along the Hudson knew something about practical forestry and the necessity of forest preservation. They had learned it in Holland. On their arrival here, they found a great, deep, dark forest stretching westward, how far they

did not know. They found it a hindrance and a constant threat. It hid their enemies. In order to build, to plant, and to make a place to live, it had to be cut down and removed. It was about this first cutting that the poet wrote.

“His echoing axe the settler swung  
Amid the sea-like solitude,  
And rushing, thundering down were flung  
The Titans of the wood.”

The early settlers soon forgot their forest principles, and the second generation cared less about them. Billions of feet of good timber were deliberately burned to ashes to get it out of the way. There was a great waste, wanton waste, because much timber was taken from lands that could never be used for tillage.

An examination of the early colonial laws, and the acts of Parliament of the mother country, shows that as far back as 1640 there was a very correct idea of the value of the splendid pine forest that covered the lands of the new world. Yet nothing practical was done until 1885 when a commission was appointed in this state, which commenced the work now carried on by the department which I now have the honor to represent. A hundred years, previously, however, a commission had been appointed to investigate and report upon the forests of the state, and devise some plan to acquire and save some of the forest lands. But nothing came of it and no legislation followed.

If our forests were converted into lumber they would be worth many millions of dollars, but they are worth many millions more if left standing, and managed according to forestry principles. Not only would they then continue to grow, but they would protect the head waters of our streams, regulate temperature, protect from hot and cold winds, serve as a health and pleasure resort, and furnish a home for game, fish and song birds.

It is time to call a halt on forest destruction, and order a forward march on forest restoration. The great pines once used for spars and planks in the king's ships are all gone. The great oak forests are seen no more. Their grandeur and beauty are known only in legend, song and story. But a worse disaster is close at hand. In a few years we shall experience the inconvenience of a wood famine. If we would minimize its effects,



and prevent the dire results of forest destruction upon the streams, fish and game, we must bestir ourselves.

At least two lines of action it is certainly our duty to follow. The State should immediately acquire a million acres more land in the Adirondacks, and five hundred thousand more acres in the Catskills. Then, not only should the State plant millions of trees each year upon its denuded lands, but it should encourage private owners to reforest all the ground not good for agriculture. The State should raise and distribute seedling trees, at actual cost, or, if possible, free of cost, to all persons who will plant them according to directions, furnished by the State.

JAMES S. WHIPPLE,  
Forest, Fish and Game Commissioner.

### A FEW STATISTICS.

The estimated total area of privately owned and National Forests in the United States is 600,000,000 acres, 32 per cent. of the total land area, exclusive of Alaska.

The lumber industry is fourth among the great industries of the United States. In 1907 between forty and forty-five billion board feet of board lumber was produced at from \$675,000,000 to \$750,000,000.

In 1907 3,963,000 cords of wood were used in the manufacture of paper, of which 925,373 cords were imported from Canada. The demand for pulpwood is making a severe drain on the spruce forests which furnish the principal supply, and investigations are under way to determine what woods, such as scrub pine, white fir, tupela, and the like, can be successfully used to insure a continued supply of material. A larger drain upon our forest resources is made by the demand for railroad ties, of which 153,000,000 equivalent to five billion board feet were used in 1907. White oak, hitherto the chief source of supply, is not plentiful enough to meet the demand indefinitely, and in many parts of the country, the supply of chestnut, cedar and cypress. is dwindling. Timber to the amount of two and one-half billion feet was used in 1907 for mine timbers.

About 700,000 trees were planted during the Winter and

Spring of 1908, the greater part in the Nebraska, Kansas, Santa Barbara and Pike National Forests. In addition to planting, extensive broadcast seeding will be conducted on the National Forests in 1909. For this purpose over five tons of tree seeds were collected during the Fall of 1908. This amount will be sufficient to sow about ten square miles of denuded land. The largest single area to be sown is on the Black Hills National Forest, where one square mile will be seeded to Western yellow pine.

—Colorado Arbor and Bird Day Annual, 1909.

### MEMORY GEMS FOR ARBOR DAY, CHIPS, EXTRACTS,

1. The groves were God's first temples.—Bryant.

2. In fact there is nothing that keeps its youth,  
So far as I know, but a tree and truth.

—Holmes.

3. I hear the wind among the trees  
Play celestial harmonies.

—Longfellow.—

4. Hail to the Trees!  
Patient and generous, mothers of mankind;  
Arching the hills, the minstrels of the wind,  
Spring's glorious flowers and summer's balmy tents.  
As sharers in man's free and happier sense,  
The trees bless all, and then brown mantled, stand,  
The sturdy prophets of a golden land.

—Selected.

5. If thou art worn and hard beset,  
If thou wouldst read a lesson that would keep  
Thy heart from fainting and thy soul from sleep,  
Go to the woods and the hills! No tears  
Dim the sweet look that Nature wears.

“Sunrise on the Hill”—Longfellow.

6 And Nature, the old nurse, took  
The child upon her knee,  
Saying: “Here is a story book  
Thy Father has written for thee.”  
“Come wander with me”, she said,  
“Into regions yet untrod;  
And read what is still unread  
In the manuscripts of God.”

—Longfellow.

7. Give fools their gold and knaves their power;  
Let fortune's bubbles rise and fall;  
Who sows a field or trains a flower,  
Or plants a tree, is more than all.

—Whittier.

8. The best verses I have produced are the trees I have  
planted.

—Holmes.

9. I can think of no more pleasant way of being remembered  
than by the planting of a tree. Birds will rest in it and  
fly thence with messages of good cheer. It will be grow-  
ing while we are sleeping, and will survive us to make  
others happier.

—Felix Oswald.

10. The nation that neglects its forests is surely destined to  
ruin.

—Elizur Wright.

11. If the trees go, men must decay. Whosoever works for  
the forest works for the happiness and permanence of  
our civilization.

—Elizur Wright.

12. Thoreau says of spring: "March fans it, April christens it,  
May puts on its jacket and trousers."

13. Our homes, our school house yards, and the resting places  
of our dead, should not be neglected, but should be  
adorned with Nature's own beautifiers—the trees.

—Emma F. Bates.

14. In France two thirds of the entire length of roads are  
bordered with trees.

15. In Germany many thousands of miles of roads are shaded  
by trees, partly forest trees, partly fruit trees.

16. The cedars of Lebanon are perhaps the best known trees  
in the world. Religion, poetry, and history have all  
united to make them famous.

17. In 1896 there were 7,000 school gardens in Austria.

18. In France gardening is taught in the primary and elemen-  
tary schools.

19. In Sweden, in 1871, there were 22,000 children in the com-  
mon schools receiving instruction in horticulture and  
tree planting. Each of more than 2,000 schools had for  
cultivation from one to twelve acres of ground.—  
Arbor Day. Its History and Observance.

—N. H. Egleston.



20. With every green tree that surrounds us with its leafage, with every shrub on the roadside where we walk, with every grass blade that bends to the breeze in the field through which we pass, we have a natural relationship. They are true our compatriots. The birds that leap from twig to twig in our gardens, that sing in our flowers, are a part of ourselves. —Goethe.
21. The man who builds does a work which begins to decay as soon as he is done, but the work of the man who plants trees grows better and better, year after year, for generations. —Charles Dudley Warner.
22. When we cut down a tree without planting another we make the world poorer. —Mable Osgood Wright.
23. Nature is thought made visible. —Henrich Heine.
24. Flowers are the sweetest things God ever made and forgot to put a soul into. —Beecher.
25. The Banyan trees of India are often capable of sheltering thousands of men. One of them in Ceylon throws a shadow at noon over four acres of ground.

## QUOTATIONS.

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Nature is the volume of which God is the author.—Harvey.

There is, after all, no house like God's out-of-door.—R. L. Stevenson.

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A man who plants a tree, and cares for it, has added at least his mite to God's creation.—Lucy Larcom.

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I think no man does anything more visibly useful to posterity than he who plants a tree.—J. R. Lowell.

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There is no spot on earth which may not be made more beautiful by the help of trees and flowers.—Holmes.

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A people without children would face a hopeless future; a country without trees is almost as hopeless.—Roosevelt.

The best and highest thing a man may do in a day is to sow a seed, whether it be in the shape of a word, an act, or an acorn.—J. B. O'Reilly.

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The man who builds does a work which begins to decay as soon as he has done, but the work of the man who plants trees grows better and better, year after year, for generations.

When we plant a tree we are doing what we can to make our planet a more wholesome and happier dwelling place for those who come after us, if not for ourselves.—O. W. Holmes.

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A man does not plant a tree for himself, he plants it for posterity; and sitting idly in the sunshine I think at times of the unborn people who will to some extent be indebted to me. Remember me kindly, ye future men and women.—Alexander Smith.

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Do not rob nor mar a tree, unless you really need what it has to give you. Let it stand and grow in virgin majesty, ungirdled and unscarred, while the trunk becomes a firm pillar of the forest temple and the branches spread abroad a refuge of bright green leaves for the birds of the air.—Henry Van Dyke.

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The tree planter and teacher united shall be declared the best benefactor of modern times—the chief provider for posterity.—H. Sterling Morton.

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Summer or winter, day or night,  
The woods are ever a new delight;  
They give us peace and they make us strong,  
Such wonderful balms to them belong;  
So, living or dying, I'll take mine ease  
Under the trees, under the trees.

—R. H. Stoddard.

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The railroads also are planting trees, although it cannot be said that they do so with any special reference to Arbor Day. A New England company is setting out ten thousand catalpas

and some chestnut and black walnut saplings upon its vacant lands. A western company is about to plant more than a hundred thousand catalpas. Years hence these trees will supply timber for ties, posts and other purposes, and the railroads are taking a long look ahead. The country would be richer in the future if the rest of us would exercise some such forethought, even if we were to plant only one tree for every hundred trees that we cut down.—West Virginia Arbor and Bird Day Manual, 1906.

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In Austria every school by law must have a gymnasium and a school garden. In France they have 30,000 of these gardens and no teacher is employed who has not the ability to teach horticulture. Gardening has been for thirty years part of the public school system of Sweden, from one to twenty acres being allotted to each school. Even in Russia, in one province alone there are over 100,000 fruit trees in the school gardens. In Germany, whence the idea came, garden schools rival agricultural colleges in the scope of their work. To America is reserved the distinction of being the only enlightened country that ignores this branch of education. No wonder we have abandoned farms and overcrowded cities!—From S. Choate, Garden and Tree Planting, Lincoln, Neb., April, 1905.

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The absence of the school garden is the most radical defect in our elementary education.

School gardens are not intended to create gardeners or farmers, but to afford the growing boy and girl an opportunity for a many-sided development.

Agriculture is the oldest of the arts and the newest of the sciences.

Manual training has brought the shop and the school together, but the farm and the school are still far apart.

With hand on the spade and heart in the sky, dress the ground and till it.

—Rhode Island Arbor Day Annual, May 8, 1908.

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It seems to me that a tree and a truth are the two longest lived things of which mankind has any knowledge. Therefore,



it behooves all men in rural life, besides planting truths, to plant trees; it behooves all men in public life to plant economic and political truths, and, as the tree grows from a small twig to a grand overspreading oak, so the smallest economic truth, as we have seen in the United States, even in the last year, can so grow as to revolutionize the government of the great Republic. I say, then, that we should all plant trees and plant truths, and let every man struggle so that when we shall all have passed away, we shall have earned a great epitaph which we find in St. Paul's cathedral, London—"If you seek my monument, look around you."—J. Sterling Morton.

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There is something noble, simple and pure in a taste for trees. It argues, I think, a sweet and generous nature to have this strong relish for beauties of vegetation and this friendship for the glories of the forests.

There is a grandeur of thought connected with this part of rural economy. He who plants an oak looks forward to future ages, and plants for posterity. Nothing can be less selfish than this. He can not expect to sit in its shade or enjoy its shelter, but he exults in the idea that the acorn which he has buried in the earth shall grow up into a lofty pile, and shall keep flourishing and increasing and benefiting mankind long after he shall have ceased to tread his paternal fields.—Washington Irving.

### OUR FLAG.

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O'er the school house, floating high,  
We see our flag as we pass by.

It has thirteen stripes and seven are red,  
And six are white as the snow instead.

With a little piece of star-filled sky  
Set in the corner to gladden the eye.

You may search and search the whole world through,  
There is naught so dear as its red, white and blue.

—Selected.

## THE FOREST LESSON.

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“In order to reforest a part of the Adirondacks, it has been found necessary to import a million young trees from Germany.”—Press Dispatch.

The throb of the ax in the forest went on through a nation vast,  
Like a fevered heart that is beating in a measure that's all  
too fast;  
We gave carte blanche to the woodman, and none stayed the  
vandal hand,  
And now, to replant our forests, we must send to the Father-  
land.

The sawmill shrieked in the mountains, and the sound was  
borne on the breeze,  
O'er the crash of the falling giants as they splintered the  
smaller trees,  
And all that was left was silence, where whispered the forests  
grand—  
And now, to repair the mischief, we must send to the Father-  
land.

We have gained some industrial captains—of lumber monarchs  
a few—  
But somehow they don't quite balance the damage that such  
chaps do;  
There's naught to make up for those barrens where wanton-  
ness set its brand,  
In these days when for forest seedlings we must send to the  
Fatherland!

—Arthur Chapman in Denver Republican.

### SUGGESTIVE PROGRAM.

1. Some familiar song.
2. Discuss the Governor's Proclamation.
3. Origin of Arbor Day.
4. Superintendent's Letter to the School Children of Montana.
5. Discussion: The Destruction of our Forests and their Restoration.
6. Tree-planting, its necessity. (Subject to be discussed by pupils, visitors and teachers.)
7. Song: "We Love the Trees". (Tune—"There's Music in the Air.")
8. Reading: Some Warning Lessons from History.
9. Recitation: Arbor Day.
10. Reading: Our Forest Reserves and the Commercial Value of Trees.
11. A Grim Prediction and A Ray of Sunshine.
12. Music: Arbor Day March. (Air "Marching Through Georgia")
13. Our Friends, The Birds. ("Give Them a Square Deal").
14. Reading: Bob-White, The Farmer's Friend.
15. Let a dozen children each recite one or more Arbor Day gems or quotations.
16. Discussion. Subject: Forestry in Europe compared with Forestry in the United States.
17. Instead of this program by the children, some visitor might be invited to make an address suited to the occasion.
18. Closing: Song America.

Note: This program is suggestive only. It may be varied and changed in any way to suit the occasion.



## MY COUNTRY.

I love my country's pine-clad hills,  
Her thousand bright and gushing rills,  
Her sunshine and her storms;  
Her rough and rugged rocks, that rear  
Their hoary heads high in the air  
In wild fantastic forms.

I love her rivers, deep and wide,  
Those mighty streams that seaward glide  
To seek the ocean's breast;  
Her smiling fields, her pleasant vales,  
Her shady dells, her flowery dales,  
Her haunts of peaceful rest.

I love her forests, dark and lone,  
For there the wild bird's merry tone  
Is heard from morn till night,  
And there are lovelier flowers, I ween,  
Than ere in Eastern lands were seen,  
In varied colors bright.

Her forests and her valleys fair,  
Her flowers that scent the morning air,  
Have all their charms for me;  
But more I love my country's name,  
Those words that echo deathless fame,  
"The Land of Liberty."

—Hesperic.

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## WHAT DO WE PLANT?

What do we plant when we plant the tree?  
We plant the ship, which will cross the sea,  
We plant the masts to carry the sails;  
We plant the plank to withstand the gales,  
The keel, the keelson, and beam and knee;  
We plant the ship when we plant the tree.

What do we plant when we plant the tree?  
We plant the houses for you and me;  
We plant the rafters, the shingles, the floors;  
We plant the studding, the lath, the doors,  
The beams and siding, all parts that be;  
We plant the house when we plant the tree.

What do we plant when we plant the tree?  
A thousand things that we daily see.  
We plant the spire that out-towers the crag;  
We plant the staff for our country's flag;  
We plant the shade from the hot sun free—  
We plant all these when we plant the tree.

—Henry Abbey.

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INVOCATION.

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(Air—"America.")

We, children of the free,  
Come here to plant this tree,  
    With prayer and song;  
A living sign to stand,  
Of love to Fatherland,  
    While years prolong.

In every flower and tree,  
God's forming hand we see,  
    And His great love,  
And every bud and leaf  
Increases our belief  
    In heaven above.

Dear God of Nature, grant  
This tree which now we plant  
    May live and grow,  
To bless with grace, with shade,  
This loved and cherished glade,  
    Our love to show.

—P. Harlow.

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THREE LITTLE TREES.

(Recitation for a tiny girl. Three other children stand near—as the trees—laughing, whispering, telling secrets, clapping hands, etc., in pretty pantomime.)

Way out in the orchard in sunshine and breeze,  
A-laughing and whispering, grew three little trees.

And one was a plum tree, and one was a pear,  
And one was a rosy-cheeked apple tree rare.

A dear little secret, as sweet as could be,  
The breeze told, one day, to the glad apple tree.

She rustled her little green leaves all about,  
And smiled at the plum, and the secret was out.

The plum told in whispers the pear by the gate,  
And she told it to me, so you see, it came straight.

The breeze told the apple, the apple the plum,  
The plum told the pear, "Robin Redbreast has come!"

And out in the orchard they danced in the breeze,  
And clapped their hands softly, these three little trees!

—Journal of Western Canada.

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### RECITATION.

Do you know the trees by name  
When you see them growing  
In the fields or in the woods?  
They are well worth knowing.

Watch them in the early spring,  
When their buds are swelling;  
Watch each tiny little leaf  
Leave its little dwelling.

Watch them later, when their leaves  
Everywhere are showing;  
Soon you'll know the different trees  
When you see them growing.

—Selected.

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### THE TEACHER'S GREATEST AMBITION.

To help a child to become unselfish, self-reliant, kind, thoughtful, considerate, honest and independent; to train to habits of usefulness; to promote purity of thought and life; to have even some small part in awakening loftier purposes and holier aspirations; to arouse in the minds of boys and girls an honest and sincere hope to be able to some extent to make happier the school, the home, the community, the state, the nation and the world—should be the greatest ambition of every teacher.—Richard C. Barrett, State Superintendent of Public Instruction, Des Moines, Iowa.



## SPRING.

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“I hear the wild geese honking  
From out the misty night—  
A sound of moving armies  
On-sweeping in their might;  
The river ice is drifting  
Beneath their northward flight.

I hear the bluebird plaintive  
From out the morning sky,  
Or see his wings a-twinkle  
That with the azure vie;  
No other bird more welcome,  
No more prophetic cry.

I hear the sparrow’s ditty  
Anear my study door;  
A simple song of gladness  
That winter days are o’er;  
My heart is singing with him,  
I love him more and more.

I hear the starling fluting  
His liquid “O-ka-lee”;  
I hear the downy drumming  
His vernal reveille;  
From out the maple orchard  
The nuthatch calls to me.

O, spring is surely coming,  
Her courtiers fill the air;  
Each morn are new arrivals,  
Each night her ways prepare;  
I scent her fragrant garments,  
Her foot is on the stair.”

—John Burroughs.

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## THE OAK TREE.

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Long ago in changeful autumn,  
When the leaves were turning brown,  
From a tall oak’s topmost branches  
Fell a little acorn down.

And it tumbled by the pathway,  
And a chance foot trod it deep  
In the ground, where all the winter  
In its shell it lay asleep.

With the white snow lying over,  
And the frost to hold it fast,  
Till there came the mild spring weather,  
When it burst its shell at last.

Many years kind Nature nursed it,  
Summers hot and winters long;  
Down the sun looked bright upon it,  
While it grew up tall and strong.

Now, it stands up like a giant,  
Casting shadows broad and high,  
With huge trunk and leafy branches  
Spreading up into the sky.

Child, when haply you are resting  
'Neath the great oak's monster shade,  
Think how little was the acorn  
Whence that mighty tree was made.

Think how simple things and lowly  
Have a part in nature's plan;  
How the great have small beginnings,  
And the child becomes a man.

Little efforts work great actions;  
Lessons in our childhood taught  
Mold the spirits to the temper  
Whereby noblest deeds are wrought.

Cherish then the gifts of childhood,  
Use them gently, guard them well;  
For their future growth and greatness  
Who can measure, who can tell?

—Colorado Arbor and Bird Day.

## MY NEIGHBOR.

---

I have a new neighbor just over the way,  
She was moving in on the first of May;  
When she took in her household goods, I saw  
They were nothing but rubbish and sticks and straw;  
But when I made her a call just now  
I found she had furnished her house somehow  
All trim and tidy and nice and neat,  
The prettiest cottage in all the street.  
Of thistledown was her carpet fine,  
A thousand times better and softer than mine;  
Her curtains, to shut out the heat and light,  
Were woven of blossoms pink and white;  
And the dainty roof of her tiny home  
Was a broad green leaf like an emerald dome.  
'Tis the cosiest nook that you ever did see,  
Mrs. Yellowbird's house in the apple tree.

—Youth's Companion.

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## WHY WE KEEP ARBOR DAY.

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(For seven children. As they take their places upon the stage, those in the seats recite the first stanza.)

Trees of the fragrant forest,  
With leaves of green unfurled,  
Through summer's heat, through winter's cold,  
What do you do for our world?

First—

Our green leaves catch the raindrops  
That fall with soothing sound,  
Then drop slowly, slowly down,  
'Tis better for the ground.

Second—

When rushing down the hillside,  
A mighty freshet forms,  
Our giant trunks and spreading roots  
Defend our happy homes.



Third—

From burning heat in summer,  
We offer cool retreat;  
Protect the land in winter's storm  
From cold, and wind and sleet.

Fourth—

Our falling leaves in autumn,  
By breezes turned and tossed,  
Will make a deep sponge carpet warm  
Which saves the ground from frost.

Fifth—

We give you pulp for paper,  
Our fuel gives you heat;  
We furnish lumber for your homes,  
And nuts and fruits to eat.

Sixth—

With strong and graceful outline,  
With branches green and bare,  
We fill the land all through the year  
With beauty everywhere.

All—

So, listen, from the forest,  
Each one a message sends  
To children on this Arbor Day,  
“We trees are your best friends.”

—Primary Education.

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## SPRING AND THE TREES.

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Never yet was a springtime,  
Late though lingered the snow,  
That the sap stirred not at the whisper  
Of the south wind sweet and low,  
Never yet was a springtime  
When the buds forgot to blow.

—Margaret E. Sangster.

### THE SUGAR MAPLE.

---

When first the sun begins to warm  
The sleeping earth's long frozen form,  
And bearing on its northern way,  
To melt the icicles by day  
Which winter, still with equal might,  
Congeals and forms again at night;  
O! who shall name in scornful mood  
The sweet, delicious, glorious flood,  
The perfect saccharinean sea,  
That floweth from the maple tree?

—Benjamin S. Parker.

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### THE OLD GRAY OAK.

---

A glorious tree is the old gray oak;  
Has stood and frowned,  
He has stood and frowned,  
On the trees around  
Like a king among his peers;  
As around their king they stand, so now  
When the flowers their pale leaves fold,  
The tall trees round him stand arrayed  
In their robes of purple and gold.

He has stood like a tower,  
And dared the winds to battle;  
He has heard the hail  
As from plates of mail  
From his own limbs shaken, rattle;  
He has tossed them about, and shorn the tops  
When the storm has roused his might  
Of the forest trees, as a strong man doth  
The heads of his foes in a flight.

—Selected.

### ARBOR DAY MARCH.

(Air: Marching Through Georgia.)

Celebrate the Arbor Day  
With march and song and cheer.  
For the season comes to us  
But once in every year;  
Should we not remember it  
And make the mem'ry dear;  
Memories sweet for Arbor Day.

### CHORUS.

Hurrah! Hurrah! The Arbor Day is here;  
Hurrah! Hurrah! It gladdens every year.  
So we plant a young tree on blithsome Arbor Day,  
While we are singing for gladness.

Flow'rs are blooming all around,  
Are blooming on this day;  
And the trees with verdure clad,  
Welcome the month of May,  
Making earth a garden fair  
To hail the Arbor Day,  
Clothing all nature with gladness.

—Ellen Beauchamp.

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### WHAT WILL YOU BE?

Dear little tree that we plant to-day  
What will you be when we're old and gray?  
"The savings bank of the squirrel and mouse  
For robin and wren an apartment house,  
The dressing-room of the butterfly's ball,  
The locust's and katydid's concert hall.  
The school-boy's ladder in pleasant June,  
The school-girl's tent in the July noon.  
And my leaves shall whisper them merrily  
A tale of the children who planted me."

—From the Intelligence.—



## ARBOR DAY.

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'Tis said that he has done some good  
On life's eternal shore,  
Who makes two blades of grass to grow  
Where one had grown before.  
Much better, then, is he who plants  
Within the arid zone,  
And makes a giant tree to grow  
Where none before had grown.

Behold them in Nebraska  
Upon the prairie plains,  
Great groves of trees—man's planting,  
Their presence there explains—  
A shelter from the north wind  
When boreas thundered forth,  
A shield against the hot blasts  
That swept up from the south.

They planted them for shelter,  
For crops and lowing herds,  
They planted them for beauty  
And homes for singing birds.  
The good J. Sterling Morton,  
Remembered be for aye!  
His noble mind and kindly heart  
Bequeathed us Arbor Day.

Great oaks upon the mountains  
Destined to sail the seas,  
We take from Nature's storehouse  
And use them as we please;  
They fight for us our battles  
And breast the ocean's foam,  
And planted in our dooryard  
They beautify our home.

And straightway feathered songsters,  
With throats that burst with glee,  
Make their abode and warble there  
An anthem for the free.  
We feel a touch celestial  
Reanimating clay,

O spare the birds! O plant a tree  
On every Arbor day!

—Will C. Meyers, Gillman, Colorado.

From Colorado Arbor Day and Bird Day Notes Issued April  
15th, 1904.

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### PUT FLOWERS IN YOUR WINDOW.

Put flowers in your window, friend,  
And summer in your heart,  
The greenness of their mimic boughs  
Is of the woods a part;  
The color of their tender bloom  
Is love's own pleasing hue,  
As surely as you smile on them,  
They'll smile again on you.

Put flowers in your window, when  
You sit in idle mood,  
For wholesome, mental ailment,  
There is no cheaper food.  
For love and hope and charity  
Are in their censer shrined,  
And shapes of loveliest thought grow out  
The flower-loving mind.

—Author Unknown.

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### WE THANK THEE.

For flowers that bloom about our feet,  
For tender grass so fresh and sweet;  
For song of bird and hum of bee;  
For all things fair we hear or see,  
Father in Heaven, we thank Thee!

For blue of stream and blue of sky;  
For pleasant shade of branches high,  
For fragrant air and cooling breeze;  
For beauty of the blooming trees,  
Father in Heaven, we thank Thee!

—Author Unknown.

## Supplement.

### HOW BIRDS CARE FOR TREES.

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Did you ever stop to think how much we owe to the birds for their care of our spreading shade trees, our fruitful orchards and our verdant woods?

The bird is just as necessary to the trees as the tree is to the bird. The tree furnishes the bird with nesting places, shelter and food. It bears buds, blossoms and seeds which birds eat, and also furnishes food for insects and other animals on which birds feed.

In return, the birds distribute the seed of the tree, that other trees may succeed it and that its descendants may occupy more ground. They assist and regulate nature's pruning of the tree: they guard the tree against destruction, for they check the increase of many creatures that feed upon it.

The truth of these statements have been proved by a study of the habits and food of birds. Let us see then how birds work for the welfare of the trees.

As the trees grow they produce too many limbs and twigs, too much foliage and fruit. The pruning of limbs is left by nature to shade, wind, ice and snow, but much pruning of twigs, leaves, buds and blossoms is accomplished by the birds that feed on them. The ruffed grouse or partridge, rosebreasted grosbeak, purple finch and other species live largely on buds, leaves or blossoms. Such pruning as they ordinarily give the tree is beneficial. The food habits of many woodland birds also tend to prevent an excessive amount of pruning by insects, and this brings us to the most important office that is performed by birds.

Birds guard all parts of the tree from the too injurious attacks of its insect enemies. The young or larvae of beetles and cicadas live in the ground, where they feed on roots. Birds which feed much on the ground scratch or dig up such larvae or grubs, or catch the beetles and cicadas when they come out of the ground.



to fly about and mate. These insects form a favorite food of very many birds. Other insects which feed on the tree bury themselves in the ground to undergo their transformations; others still hide among the dead leaves of the forest floor. Such insects are sought out by scratching birds, like the partridge, brown thrasher and chewink.

The trunks and limbs of trees are pierced by the larvae of boring beetles. These grubs cut channels or burrow in the wood. Other species, known as bark beetles, tunnel between the bark and the wood.

The grubs of boring insects are dug out of their hiding places by woodpeckers. These birds are of great service, for a borer will sometimes kill a tree, and a single woodpecker often destroys many borers in a day. Insects that hide in the crevices of the bark are sought by prying chickadees, creepers and nuthatches. Insects that eat buds and leaves are hunted by warblers, vireos, thrushes, orioles, tanagers, cuckoos,—a host of birds that feed much among the foliage of trees. Insects that reach the flight stage and fly about among the tree tops are taken on the wing by warblers and flycatchers. Those that escape all these and test their new-grown wings by longer flights are chased by flycatchers; while those that reach the upper air are pursued by swallows, swifts or nighthawks.

When we realize that the unchecked increase of one species of insect might easily be sufficient in a few seasons to enable it to destroy most of the trees of the woods, and when we consider that the birds restrain the increase of hundreds of species of insects, then we can appreciate the value of birds as protectors of trees. It is now well understood that the birds and other natural enemies of insects ordinarily keep most tree pests so well in check that they do no great or serious injury to trees.

When it is stated on good authority that the people of the United States have suffered from the ravages of insect pests to the extent of about seven hundred million dollars in a single year, when the agriculture of the small State of Massachusetts is said to lose nearly five million dollars annually from the attacks of insects, it is time to look about us to see how we can

get help in the war against them; it is time to do something to increase the numbers of the creatures that feed upon these insects.

But possibly the most useful bird to crops is the Bob White, the common partridge. The agricultural reports of the southern states, especially Virginia, show that annually several hundred tons of pernicious weed seeds are destroyed by Bob Whites alone.

It is figured that from September 1 to April 30 annually in Virginia alone the total consumption of weed seed by bob whites amount to 573 tons. Some of the pests which it habitually destroys, the report says, are the Mexican cotton boll weevil, which damages the cotton crop upwards of \$15,000,000 a year; the potato beetle, which cut off \$10,000,000 from the value of the potato crop; the cotton worms, which have been known to cause \$30,000,000 loss in a year; the chinch bug, and the Rocky Mountain locust, scourges which leave desolation in their path and have caused losses to the extent of \$100,000,000 in some years.

While we can do little to multiply those useful insects that feed upon other insects, we can protect useful birds, and so bring about their increase. An increase of birds always occurs where conditions are favorable. Tree planting in the prairie States was followed by a multiplication of the numbers of insectivorous birds.

One of the best possible ways to observe Arbor Day is by planting trees, shrubbery and vines that will produce food for birds to eat. Trees like the mountain ash, that retain their fruit in winter, are very attractive to birds. Such shrubs as the barberry and sumach, and vines like the Virginia creeper or woodbine, also furnish fruit for birds in the late fall and winter.

There are many trees, shrubs and vines which bear fruit that is not eaten by human kind, but is acceptable and nourishing to birds. The Russian mulberry is one of the most valuable trees to plant, as its fruit ripens early, and many birds prefer it to early cherries or strawberries.

Cone-bearing trees should be planted in groups, to protect the birds from cold winds and storms. These evergreens and

tangles of wild shrubs and vines along the fences and roadsides afford places of refuge to which the smaller birds can fly when pursued by their enemies.

Swallows, swifts and phoebes can be encouraged by leaving barns, chimneys and sheds open, that they may enter where they please.

Even if our feathered friends were of no practical value, they would still be indispensable to the world's best happiness. As little messengers of good cheer, as exponents of grace, song and living beauty, as examples of parental devotion, they help to brighten and uplift our lives. All that we can do to render their lives freer, safer and happier should be done as a duty,—as the willing payment of an obligation that we owe.—Mass. Arbor Day Manual, 1906.

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### WHAT THE LITTLE BIRD SAID.

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A little bird perched on my window sill,  
And swayed and swung in the morning breeze;  
And this is the song that he sung to me—  
“Oh, what would we do if there were no trees?

“Where would we build our pretty nests,  
If never a tree in the whole land stood?  
Where would we hang our cradles up  
To rock our dear little baby brood?

“In the cracks of the bark on the good old trees  
We find the insects we like to eat;  
And the green leaves crowded on branch and twig  
Shelter us from the sun's fierce heat.

“Little girl, little boy,” the birdie sang,  
As he spread his bright wings to fly away,  
“If you truly love your feathered friends,  
Plant trees for the birds on Arbor Day.”

—Virginia Baker.



## BIRD TRADES.

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The swallow is a mason,  
And underneath the eaves  
He builds a nest and plasters it  
With mud and hay and leaves.

The woodpecker is hard at work;  
A carpenter is he;  
And you may find him hammering  
His house high up a tree.

The bullfinch knows and practices  
The basket-maker's trade;  
See what a cradle for his young  
The little thing has made.

Of all the weavers that I know,  
The oriole is the best:  
High on the apple tree he weaves  
A cozy little nest.

The goldfinch is a fuller;  
A skillful workman he!  
Of wool and threads he makes a nest  
That you would like to see.

Some little birds are miners;  
Some build upon the ground;  
And busy little tailors, too,  
Among the birds are found.

The cuckoo laughs to see them work;  
"Not so," he says, "we do.  
My wife and I take other's nests,  
And live at ease—cuckoo!"

—Anna B. Thomas.

## BOB WHITE—THE FARMER'S FRIEND.

Of the several species of quail found in the United States the most faithful friend of the farmer is our own common partridge or Bob White, a name which not only includes the typical bird of the Eastern states, but also the two sub-species of Florida and Texas. Although slightly changed by climate and environment, it is practically the same bird that ranges over the hills of New England, through Virginia and the Carolinas, southward to the sunny shores of Florida and also westward to South Dakota, Kansas and Texas.

This quail has long been popular as an article of diet, and also for the beauty of his modest coat, or the softer covey-call which summons the flock to a common resting-place in the shades of of evening.

It has taken science a long time to find out his great value. We now know that the Bob White is very seldom guilty of trespass, but that he is of constant value as a destroyer of weeds and injurious insects. From a careful examination of many hundreds of stomachs, it has been found that from early autumn until spring his food consists principally of vegetable matter, a portion of it being found by gleaning the fallen grain in fields where the harvest has been gathered; but aside from this the main food of the quail during the autumn and winter consists of the seeds of noxious and troublesome weeds, these seeds, indeed, making up an average of one-half of his diet for the whole year.

Weeds—Eighty-five different weeds have been found to contribute largely to the bird's diet and his marvelous appetite is his most valuable asset. Crops and stomachs have been found which were crowded with rag-weed seeds to the number of 1,000, while another had eaten as many seeds of crab grass. A bird shot in October 1902 at Pine Brook in New Jersey, had eaten 5,000 seeds of green ox-tail grass, and one killed on Christmas Day of 1901 at Kinsale, Va., had taken about 10,000 pig-weed seeds.

When we consider that a single one of these might produce a plant bearing thousands of seeds in a single season, and this process, if un-checked, would in three years, produce not mil-

lions, but billions of weeds, we may get some idea of the value of the quail as a weed destroyer—a work in which he is ably assisted by the mourning dove, the meadow lark and other allies.

Beside weed seeds and grain, he also eats more or less the seeds of pine and maple, acorns and beech nuts, as well as of various wild fruits in their season, including the berries of poison ivy.

The Chinch Bug—After a winter in which a vegetarian diet has largely predominated, Bob White has no desire for the sprouting grain, but in the early spring he is out on the war-path hunting for animal food. Although in most climates he can find more or less insect food during every month in the year, his bright eyes are always on the lookout for the earliest comers among the insect pests and during the spring, summer and autumn, his services in this direction are invaluable. The chinch bug leads the list of expensive insects with a tribute levied upon the American farmers which is estimated at \$100,000,000 per year. This destructive little pest invades the wheat fields in armies, but Bob-White leads his covey to the fray, and if he had warriors enough, he could eradicate the foe, for the bugs winter in just such situations as are frequented by the quail, and the birds feast upon them whenever they are available.

The Grasshopper stands next in the amount of damage done, and \$90,000,000 per year is a conservative estimate of his tax upon this country, for he sometimes devastates whole states. But here too, Bob-White is on duty with the meadow larks, all of them feeding voraciously upon the invader.

The Potato Bug is another enemy which has cost the American farmer a vast amount of trouble and expense. In spite of large expenditures for poisons, this beetle still costs us about \$8,000,000 per year. Very few birds will touch this disgusting creature, but the rose breasted grossbeak and faithful Bob-White are always ready for them. The potato bug is not an occasional article of food, but when available is made a constant article of diet; one crop of a quail has been found to contain 100 of them, neither is this useful habit of protecting the potato vines confined to any one locality. Reports to the same effect have come to the Biological Survey from Ontario, New Jersey, Vir-



ginia, Maryland, Iowa, Nebraska, Kansas and Texas. In some cases of badly infested potato vines, Bob-Whites have been seen patrolling the rows, and carefully picking off the bugs.

The Mexican Cotton Boll Weevil came over the border in 1894 and less than ten years later it was costing America \$15,000,000 per year and these figures soon rose to \$20,000,000. As yet it is mostly confined to Texas, but threatens to sweep over the entire cotton belt. Hence all the cotton states would do well to prohibit the shooting of a single quail until this foe is exterminated, for Bob-White is looking for him and feeding upon him.

Bob-White also destroys the striped cucumber beetle which makes such havock with cucumbers, squashes, etc. In fact, he has to his credit, a list of fifty-seven different beetles, twenty-seven varieties of bugs, nine species of grasshoppers, locusts, and their kindred, and thirteen sorts of caterpillars, besides ants, flies, wasps, spiders, etc. The crops and gizzards examined in the Government laboratories to ascertain the character and proportions of the quail's food, were collected from twenty-one states, besides Canada, District of Columbia and Mexico.

These birds are especially valuable during the nesting season, as the young feed almost entirely upon insects, twelve or more different species having been identified as the food of the downy chicks.

Man is Bob-White's worst enemy, but by shorter open seasons with rigid game laws carefully enforced, it may be possible to enable the bird to gain ground even in localities where he is threatened with extinction. Some wise farmers, especially in Maryland and Virginia, are feeding their quail in cold weather. Wheat, buck wheat, corn, millet and other grains may be used for this purpose and should be scattered, if possible, under briars where they may have some protection from hawks. Bob-Whites have been known to feed with chickens on Sarasota Key, off the western coast of Florida, as well as other points further north.

In cold climates a sheaf or two of grain might be placed on a platform slightly raised above the snow, and thus afford them both food and shelter. Sumac trees and berries should be left

for their benefit, and also the edge of grain in the wheat fields, for the farmer can well afford to feed his most valuable ally in his fight against weeds and insects.

—Alabama Bird Day Book, 1909.

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## OUR FRIENDS, THE BIRDS.

### Give Them A Square Deal.

Let me call your attention to the fact that children are the worst enemies song and insect destroying birds have. Men do not slaughter these valuable friends of the farmers, but boys, thoughtlessly and recklessly, slay the sweet songsters of the trees, more for the purpose of killing them or to show their marksmanship with a rifle or gun. I am sure that if our boys knew that these bright colored song birds destroyed each year millions of tons of weed seeds, which, if left to grow, would retard the farmers in making their crops, and if we knew that the birds devour insects that prey on growing vegetation, very much to its damage, every revengeful hand against the warblers would be forever stayed.

Suppose that all the school boys in the United States should for one day try to kill all the birds they could, the slaughter of these harmless creatures would be tremendous; millions would be destroyed. Nature having placed birds in the world to hold a check on the onslaught of harmful insects and of injurious weed seeds, the very laws that were originally designed to control the universe would be thrown out of joint, in the event all birds were killed. It would be a very sad day indeed not only for our farmer friends, but for people everywhere if the bugs and worms should fall upon the crops and destroy them. If such should be the case, we not only would be deprived of grain from which to make our bread but would likewise be driven to the necessity of doing without clothing that is made from cotton.

It is easy to see therefore that the terrible state of want and discord, which would prevail, would drive our people to desperation. Each one of us can contribute something towards preventing the possibility of such a state of existence by re-

fraining from killing the birds, which after all are harmless creatures, and are likewise our farmers best friends.

As a result of scientific research of the most extended nature it has been ascertained that the cause of the prevalence of many maladies, and the problem of weed control is largely attributed to the slaughter of our insectivorous birds, which in the past have been wantonly murdered by the millions. Birds annually destroy thousand of tons of noxious weed seeds and billions of harmful insects; they were designed to hold in check certain forces that are antagonistic to the vegetable kingdom. The Mexican boll weevil which has made such desperate ravages on the cotton fields of Texas, is steadily marching into Alabama, and it has been ascertained that birds are its deadliest enemies. A noted French scientist has asserted that without birds to check the ravages of insects, human life would vanish from this planet in the short space of nine years; he insists that insects would first destroy the growing cereals, next would fall upon the grass, and upon the foliage, which would leave nothing upon which the cattle could subsist.

The possibilities of agriculture having been destroyed, domestic animals having perished from want of provender, man, in his extremity in a barren and desolate land, would be driven to the necessity of becoming cannibalized, or subsisting exclusively on a diet of fish. Even granting that only a portion of what the eminent Frenchman asserts is true, it is easy to glean from his theory that birds are man's best allies, and should be protected not only on account of their innocence, bright plumage and inspiring songs, but because they render to the farmer valuable assistance every day.

The wholesale slaughter of our song and insectivorous birds, which was so persistently waged in the past, has been practically stopped; even in the cities where the birds were curiosities, they are now seen in large numbers by the inhabitants who delight to hear once more the clear, sweet notes of the thrilling songsters of the forests.

—Alabama Bird Day Book, 1909.











